GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
DEPARTMENT OF FISHERIES

EXPLORATORY FISHING FOR SNOW CRAB

in

Newfoundland Waters during 1980 and 1981

(A two section report)

DEVELOPMENT BRANCH REPORT No. 23
February 1982

SECTION ONE

EXPLORATORY FISHING FOR SNOW CRAB IN NOTRE DAME BAY, THE NORTHWEST COAST, SOUTHERN LABRADOR AND PLACENTIA BAY DURING 1980

PROJECT CO-ORDINATOR: ROBERT HOYLES

REPORT

BY

NORAH LEE*

AND

JIM ROBERTS

FISHING OPERATIONS UNIT, DEVELOPMENT BRANCH

DEPARTMENT OF FISHERIES

ST. JOHN'S, NEWFOUNDLAND

*Both authors were temporarily contracted by the Dept. of Fisheries. Present addresses unavailable.

TABLE OF CONTENTS

	Page
Summary	i
List of Tables	ii
List of Figures	iii
INTRODUCTION	1
SURVEY METHODS AND MATERIALS	3
Survey Plan	3
Fishing Gear	4
Survey Vessels	5
Survey Areas	6
RESULTS	8
Notre Dame Bay	8
Northwest Coast	9
Southern Labrador	9
Placentia Bay	10
St. Lewis Inlet, Labrador	11
Shell Width Frequencies	12
Water Temperatures	13
DISCUSSION	14
ACKNOWLEDGEMENTS	18
REFERENCES	19
APPENDIX I	20
APPENDIX II	34

SUMMARY

1. Exploratory fishing was carried out in four regions; Notre Dame Bay, the Northwest coast, Southern Labrador and Placentia Bay to investigate the existing stock of snow crab (Chinoecetes opilio) and to estimate the potential for commercial fisheries. A smaller scale study was conducted in St. Lewis Inlet to determine if crab could be caught in a sheltered inshore region.

2. Notre Dame Bay showed the highest catch rates and projected annual landings within the range recorded by commercial fishing enterprises. This region, of those surveyed, showed the greatest potential for a commercial fishery.

3. The three other areas showed annual projected landings below recorded commercial catches. As well, the quality of crab from Placentia Bay was comparatively poor. However, to fully measure the potential of these regions, more indepth studies would be required.

4. The results from the St. Lewis Inlet study suggested that crab fishing in inlet areas may be a feasible venture which could supplement regular fish catches. This would be especially important in Southern Labrador where the fishing season is relatively short.

LIST OF TABLES

		Page
TABLE 1:	Catch of Snow Crab in Notre Dame Bay, June 11 - July 12, 1980.	21
TABLE 2:	Commercial Crab Fishery Potential in Notre Dame Bay extrapolated from exploratory catch rates, June 11 - July 12, 1980.	23
TABLE 3:	Catch of Snow Crabs, Northwest Coast, July 18 - August 5, 1980.	24
TABLE 4:	Commercial Crab Fishery Potential of the Northwest Coast extrapolated from exploratory catch rates, July 18 - - August 5, 1980.	25
TABLE 5:	Catch of Snow Crab in Southern Labrador, August 23 - September 8, 1980.	26
TABLE 6:	Commercial Crab Fishery Potential, Southern Labrador, extrapolated from exploratory survey catch rates, August 23 - September 8, 1980.	27
TABLE 7:	Catch of Snow Crabs from Placentia Bay, November 18 - December 8, 1980.	28
TABLE 8:	Commercial Crab Fishery Potential, Placentia Bay, extrapolated from exploratory survey catch rates, November 18 - December 8, 1980.	29
TABLE 9:	Catch of Snow Crabs through the ice, St. Lewis Inlet, Labrador, 1980.	30
TABLE 10:	Bottom temperatures and station depths recorded during the Snow Crab survey in Placentia Bay; November 18 - December 8, 1980.	31
TABLE 11:	Bottom temperatures and station depths taken during the Snow Crab survey, Southern Labrador; August 23 - September 8, 1980.	32
TABLE 12:	Bottom temperatures and station depths recorded during the Snow Crab survey on the Northwest Coast; July 18 - August 5, 1980.	33

LIST OF FIGURES

		Page
Figure 1:	Survey areas for Snow Crab in 1980 (Newfoundland)	35
Figure 2:	Survey areas for Snow Crab in 1980 (Labrador)	36
Figure 3:	Hauling crab pots onboard the M.V. "Cindy Elizabeth" during the Notre Dame Bay survey, 1980	37
Figure 4:	A typical conical pot used in the Newfoundland Snow Crab fishery	38
Figure 5:	Conical crab pots in set position	39
Figure 6:	Snow Crab survey results in Notre Dame Bay in 1980, total catch per station, fishing an average of 45 pots per day	40
Figure 7:	Snow Crab survey results off the Northwest Coast of Newfoundland in 1980, total catch per station, fishing an average of 35 pots per day	41
Figure 8:	Snow Crab survey results in Southern Labrador in 1980, total catch per station, fishing an average of 18 pots per day	42
Figure 9:	Snow Crab survey results in Placentia Bay in 1980, total catch per station, fishing an average of 72 pots per day	43
Figure 10:	Snow Crab survey area in St. Lewis Inlet, Labrador, 1980	44
Figure 11:	Width frequencies of Snow Crabs from survey catches in Notre Dame Bay in 1980 (Stations 1-6)	45
Figure 12:	Width frequencies of Snow Crabs from survey catches in Notre Dame Bay in 1980 (Stations 7-12)	46
Figure 13:	Width frequencies of Snow Crabs from survey catches in Notre Dame Bay in 1980 (Stations 13-18)	47
Figure 14:	Width frequencies of Snow Crabs from survey catches in Notre Dame Bay in 1980 (Stations 19,20,22, and 25)	48

Page

FIGURE 15: Width frequencies of Snow Crabs from survey catches off the Northwest coast in 1980 (Stations 1, 2 and 4-6) 49

FIGURE 16: Width frequencies of Snow Crabs from survey catches off the Northwest coast in 1980 (Stations 7, 8, 11 and 13) 50

FIGURE 17: Width frequencies of Snow Crabs from survey catches off the Northwest coast in 1980 (Stations 14, 15) 51

FIGURE 18: Width frequencies of Snow Crabs from survey catches off Labrador in 1980 (Station 1) 52

FIGURE 19: Width frequencies of Snow Crabs from survey catches in Placentia Bay in 1980 (Stations 1, 3, 4, 6, 7, and 12) 53

INTRODUCTION

Exploratory fishing for snow crab (Chinoecetes opilio) represents part of the Department of Fisheries ongoing fisheries development program for underutilized species. Snow crab has been commercially fished in this province since 1969 and for a number of reasons it continues to involve a limited number of harvesting licenses. Fishermen holding these licenses have concentrated efforts in relatively few areas where crabs are known to exist. For the 1980 fishing season, a total of 9,000 tonnes of snow crabs were landed. This employed 225 licensed fishermen and 51 vessels.

Fishermen operating outside the crab fishing areas continually report the presence of crabs which often become a severe nuisance especially in groundfish gillnets. These fishermen have requested the Government to identify the extent of these crab stocks and make every effort to promote their commercial utilization. In response to these requests the Department of Fisheries conducted surveys during 1979 (Development Branch Report No. 7). During 1980, the crab survey program was continued as the Department undertook additional exploratory crab fishing projects in four (4) other areas to determine the presence of crabs. Included in the 1980 survey were (1) Notre Dame Bay, Fogo Island; (2) Northwest Coast; (3) Black Tickle, Labrador and (4) Placentia Bay (Figure 1, 2). These surveys were conducted during the summer and fall period of the fishing season using two chartered vessels and one Government-owned vessel.

In 1978, a Federal Fisheries herring study conducted in Mary's Harbour, Labrador during March and April incidentally encountered snow crabs under the ice in this area (Mr. Eric Way, Federal Department of Fisheries and Oceans Personal Communication). To investigate this further the Department engaged local fishermen to set crab pots in St. Lewis Inlet, Labrador during February, March and April of 1980. This was a preliminary investigation of the stock in the area and hence is not as extensive as work done in the four other regions.

This report outlines survey areas, methods employed, and catch results from the four areas mentioned. As the main purpose of the survey was to locate commercial quantitites of snow crabs, it does not address factors such as marketing conditions, processing capabilities, and other factors that may influence the prospects for a commercial fishery.

SURVEY METHODS AND MATERIALS

Survey Plan

For each area to be surveyed, fishing stations were plotted on nautical charts designed to encompass all possible crab grounds based on water depth and bottom type as indicated on the charts. In addition, input as to fishing station location was obtained from local fishermen who reported where crabs were caught by fixed fishing gear. Each fishing station measured 52 square kilometers. The proposed survey plan involved fishing seven (7) fleets of crab pots (56 pots) over this area at each station for a minimum of 20 hours. This plan was changed for Placentia Bay where three (3) fleets of 60 pots each were fished on a daily basis at each fishing station.

Crab pots were to be hauled at one fishing station after the required fishing period, and baited and reset in another fishing station on a daily basis.

Crabs taken in each pot were measured individually across the carapace to help determine numbers at commercial sizes within the population. Other data concerning location, time of setting and retrieval, bait type and "soak time", etc. was also recorded. Bottom temperatures were measured using reversing thermometers, (KAHLSICO #295WA101 and KAHLSICO #295WA203).

Procedures used in the St. Lewis Inlet area differed from those described above. In 1980, sets of five (5) pots were placed below the ice, left for a minimum of one

fishing day (Table 9) and hauled with the aid of snowmobile. Pots were then rebaited and reset in another area.

The predominant bait used during the survey was squid, however, mackerel or herring was used when squid was not available. Squid is preferred by commercial fishermen since it remains in the pots for longer periods than herring or mackerel.

Fishing Gear

Conical crab pots, identical to the commerical fishing type, were used throughout the survey. This type of pot is 117cm in diameter at the bottom and 69cm at the top. The height of the pot is 64cm and the rod iron frame is covered with 14cm mesh polypropylene webbing. The opening for the crab is at the top and a vinyl plate extending into the pot prevents crab escapement. A "drawstring" closes the bottom webbing and releases it when emptying the crab catch. Bait is placed on insulated wire attached to the vinyl plate extending into the pot. Each pot weighs approximately 9kg.

Conical pots are fished in strings or fleets consisting of a number of pots equally spaced. Commercial crab fishermen normally use between 50 and 60 pots to a fleet. However, throughout the survey, eight (8) pots were used in each fleet. The pots were attached to 12.7mm diameter polypropylene rope which in turn, was attached to two (2) 152cm diameter floats at each end of the moorings. Each mooring was lengthened by ninety (90)m in case of unknown bottom

depressions or tide in the area. As previously mentioned, the numbers of crab pots used were different for the St. Lewis Inlet study (Figure 3-5).

Survey Vessels

1. M.V. "Oderin".

The Department of Fisheries vessel the M.V. "Oderin" was used for the Labrador survey during 1980. This 20m, (O.A.L.) vessel is equipped with the following:

- Japan Mariner 720 depth sounder, model JMF-707A
- Decca Marine radar, model 090 with seven range scales from 5-36 nautical miles
- Decca navigator, mark 21 system
- Loran C, model #6811 (32 volts)
- Wesmar sonar, model 55200B
- VHF Sailor ship to shore radio, model RT144B #178862

2. M.V. "Cindy Elizabeth"

The M.V. "Cindy Elizabeth" a 20m (O.A.L.) vessel, from Point Leamington, Notre Dame Bay was chartered for a 60 day fishing period in Notre Dame Bay and the Northwest coast. The vessel's equipment consisted of:

- Decca 101 radar with a 24 km range
- JRC Fish Finder, model NJA-155; 315m depth range
- Hy Seas 55 radiotelephone
- Kaar sailfish VHF radio
- Decca navigator, mark 21 system

3. M.V. "Lady Day"

This 17m (O.A.L.) vessel from St. Joseph's, St. Mary's Bay was chartered for a 15 day fishing period to survey part of Placentia Bay. As this vessel was involved in the commercial crab fishery prior to the Placentia Bay survey, it was fully equipped to conduct the exploratory fishing program. Equipment included:

- Canadian Marconi JRC 170 radar with a 27km range
- Canadian Marconi JRC 300 radar with a 38km range
- Wesmar sonar, model SS160
- Robertson Autopilot, model AP30
- Canadian Marconi JRC depth sounder
- Simard EL depth sounder
- Decca navigator, mark 21 system
- Canadian Marconi CH100 ship to shore radio
- PACE VHF radio

For crab pot hauling, each vessel was equipped with a Marco hydraulic pot hauler, model J-0109, similar to those used on commercial crab boats.

Survey Areas

1. Notre Dame Bay

In Notre Dame Bay, twenty-five (25) fishing stations were selected in an area extending from Twillingate to east of Fogo Island (Figure 6). Fishing stations were situated in this area from the near shore out to a distance of 48km. All 25 fishing stations were fished during the survey.

2. Northwest Coast

Fifteen (15) fishing stations were selected on the Northwest coast from Point Riche southward to Daniel's Harbour and offshore a distance of 48km (Figure 7). All fishing stations were fished during the survey.

3. Labrador

This survey was planned for fourteen (14) fishing stations between Spotted Islands in the North to Seal Islands in the South (Figure 8). Only six (6) of the designated fishing stations were surveyed.

4. Placentia Bay

In Placentia Bay, 15 fishing stations were selected in the area from Red Island to the mouth of the bay (Figure 9). Only 13 of the 15 fishing stations were fished during the survey.

5. St. Lewis Inlet, Labrador

In St. Lewis Inlet,in 1980, pots were set below the ice at six (6) locations towards the mouth of the Inlet (Figure 10).

RESULTS

Notre Dame Bay

The Notre Dame Bay survey was carried out from June 10 to July 12, during which 25 stations were fished (Figure 6). Due to pot losses caused by rough bottom and heavy tides, the number of crab pots fished per station varied slightly. Of the 56 pots per station originally set, an average of 54 pots were hauled with a minimum of 40 at Station 2 and a maximum of 56 at Station 5 and Stations 8 to 25 inclusive. Over the 30 day fishing period, an average of 45 pots were hauled per day with a minimum of 16 pots and a maximum of 56 pots hauled/day[1]. Catches of over 500 commercial crabs per day were obtained on six occasions with a maximum of 2515 crabs taken on June 20.

The total catch was 16,921 crabs with 12,834 (76%) being commercially valuable (i.e. those greater than 95mm wide), (Table 1). The average number of commercial crabs per pot[2] was 10 with a range from 0 at Station 24 to 45 at Station 8. Using .45kg as the average weight per crab[3], an average of 4.5kg of crabs/pot and a range of 0-20.2kg of weight crabs/pot were realized. In relation to the number of soft shell crabs, comprising 2% of the total catch, 235 or 1.4% were large while 101 or 0.6% were undersized. Of the total catch only 6 crabs were females.

---

1. Fishing effort, in terms of pots hauled/day, was calculated by dividing the total number of pots hauled by the total number of fishing days in the area.

2. Catch results, in terms of numbers of commercial crabs per pot and weight of commercial crabs per pot, were calculated as follows:

$$\#\ \text{crabs/pot} = \frac{\text{total number of commercial crabs per station}}{\text{total number of pots hauled per station}}$$

$$\text{wgt. of crabs/pot} = \frac{\text{total weight of commercial crabs per station}}{\text{total number of pots hauled per station}}$$

3. Average weight of a commercial crab = .45kg (Departmental source).

Note: These units of measurement are used throughout the text.

Northwest Coast

The crab survey on the Northwest coast took place from July 17 to August 5. During that time 15 fishing stations were fished (Figure 7). The number of pots hauled per station varied due to pot losses caused by rough bottom and strong tides. Though 56 pots per station were set, an average of 51 were hauled per station with a minimum of 24 pots at Station 10. The full complement of 56 pots was hauled at 12 of the 15 stations. Over the 30 day fishing period, this resulted in an average of 35 pots with a range of 8 to 56 pots hauled per day.

The total catch was 3,066 crabs with 74% or 2,262 of them being commercial. The average number of commercial crabs per pot was 3 with station averages ranging from 0 to 101 (Table 3). This, computed as kg of crabs/pot, gives an average of 1.2kg with a range of 0 - 45.5kg.

Southern Labrador

The crab survey in Southern Labrador, which started on August 21, was hampered by vessel engine trouble and poor weather conditions. As a consequence, the survey was terminated on September 29. Of the 14 stations to be surveyed, a total of 6 were completed (Figure 8). During that period, 312 pots were fished with an average number of 52 pots hauled per station. Though fishing time was recorded in hours, the average fishing effort can be calculated to be 18 pots hauled/day with a minimum of 8 and a maximum of 56 pots hauled/day.

Of the 6 stations completed, a total of 314 crabs were caught (Table 5), with approximately 74% (231) being of commercial size. The average number of commercial crabs per pot was 1, ranging from 0 to 3 per pot. In terms of kg of crab/pot, this gives an average of 0.2kg. From a total of 312 crabs, 4 were soft shelled and two were female.

Placentia Bay

The crab survey in Placentia Bay started on November 18 and concluded on December 8 when weather conditions forced curtailment of the survey. During that period a total of 13 stations were fished (Figure 9). The number of pots used to fish the individual stations varied from 53 pots at Station 15 to 178 pots at Stations 1, 3 and 6, with an overall average of 147 pots per station. This was due to pot lossess caused by rough bottom conditions. During the survey a total of 1911 individual pot hauls were made. Again, though fishing time was recorded in hours, the average fishing effort can be calculated as 72 pots hauled/day ranging from a minimum of 19 at Station 11 to a maximum of 178 pots at Stations 1 and 6.

The number of crabs caught totalled 3,821. Measurements from every 5th pot indicated that 787 or 20.6% of the overall catch were commercial size. The average number of commercial crabs per pot was 2 with a range of 0 to 10 per pot. This gives an average of 0.8kg of crab per pot with a range of 0 - 4.5kg.

A total of 4 females were obtained from 3,821 crabs. A total of 129 or 3.4% were soft with 2.0% of total catch being undersized.

The crabs caught in Placentia Bay did not have the same clean appearance as crabs caught in other survey areas. Placentia Bay crabs had numerous black patches over the carapace and legs. Most crab were lifeless and sluggish in comparison with crabs caught commercially in other survey areas.

A sample of Placentia Bay crab was processed by a commercial crab processor but was unacceptable for marketing. Meat stuck to the shell or broke when extracted making the product acceptable only for lower priced salad pack, at best.

St. Lewis Inlet

The 1980 St. Lewis Inlet survey took place over a period of eleven (11) fishing days (Figure 10) from February 27 to April 11. Five pots were hauled in each of six locations yielding a total of 94 crabs. Commercial sized crab totalled 92, constituting 98% of the total catch. The average number of commercial crab per pot was 3 with a range of 0 - 10 per pot (Table 9). This gives an average of 1.5kg, a minimum of 0kg, and a maximum of 4.5kg per pot hauled.

Fishermen found that when the crabs were pulled to the surface, on the ice, they immediately froze causing the loss of legs in some instances.

Shell Width Frequencies

For each area with catches greater than 50 Snow Crab per fishing station, frequencies were combined and plotted as percentages at each shell width (Figures 11 to 18).

1. Notre Dame Bay

The majority of width frequencies of Snow Crabs in Notre Dame Bay have modes*of 105mm while the others have modes ranging from 95 to 120mm. Notre Dame Bay had 76% of the total catch above the minimum 95mm size and the graphs indicate percentages which were well above this size (Figures 11-14).

2. Northwest Coast

Of the 11 fishing stations with crab catches over 50, three had modes of 95mm and the others ranged from 100 to 115mm. One fishing station had a mode of 90mm, showing the highest percentage of undersized crabs. The Northwest coast area had 74% of the total catch of commercial size (Figures 15-17).

3. Labrador

In Labrador, only one fishing station had enough crabs for a width frequency. At this station the mode was 110mm and 74% of the total catch was of commercial size (Figure 18).

4. Placentia Bay

In Placentia Bay, six of the 13 fishing stations surveyed had crab catches over 50 from which frequencies could be plotted. The modes of four graphs are only 85mm

*Occurring the most times in a given sample.

which is less than the minimum commercial crab size. Only one station showed a mode of 95mm, (the minimum commercial size). Only 21% of the crabs caught in Placentia Bay were commercial (Figure 19).

5. St. Lewis Inlet

No individual hauls yielded enough crabs to warrant computation of shell width frequencies. However, the survey showed high percentages of commercial crabs.

Water Temperatures

The Snow Crab appears to be most abundant when bottom temperatures are within the range -1°C to 2.5°C (Squires,1965). As the bottom temperature is an important criterion, bottom temperatures were taken in each fishing station included in the survey except in Notre Dame Bay (Tables 11-13).

In Placentia Bay, all bottom temperatures taken fell within the temperature range with only one temperature above 0°C (Table 11). In Labrador only two temperatures were taken, both being at -0.9°C (Table 12).

On the Northwest coast, there was a large difference between stations. Only 4 of the 15 temperatures taken were below 0°C. The remaining 8 temperatures recorded ranged from 1.1°C to 5.7°C. It should be noted that crabs were caught in the areas with temperatures outside the temperature regime considered suitable for crab, thus suggesting a wider range in relation to temperature tolerances.

In St. Lewis Inlet, during the 1980 survey, bottom temperatures were -1.9 to -1.8.

DISCUSSION

In the report, An Economic Assessment of the Newfoundland Crab Fishery, 1979 by P.R. Hood, it was stated that a commercial enterprise required a daily average catch of commercial crab per pot of 12kg in order to have a viable fishery. However, in the four areas surveyed, the average kg/pot was considerably lower. Notre Dame Bay most closely approximated the above value with an average of 4.3 kg/pot with a range of 0 - 20.2 kg/pot (Table 2).

Similarly, projected annual commercial landings for three of the four areas (i.e. excluding the Notre Dame Bay area) would be lower than yearly catches in the commercial fishing areas mentioned above. Hood (1979) reported annual landings from individual licensed enterprises in the White Bay - Green Bay area which ranged from 11.8 tonnes to 103.4 tonnes with an average of 62.3 tonnes per enterprise. In the Bonavista Bay - Trinity Bay - Avalon Peninsula region, the average annual landing per individual enterprise was 265.6 tonnes with a range of 48.5 - 559.8 tonnes.

For the Notre Dame Bay region, based on 150 crab pots fished for 150 days, the average amount predicted landed would be 97 tonnes per year within a range of 0 - 456 tonnes per year (Table 2). In this region, where the highest daily catches were recorded, commercial crab represented 76% of the total catch. The 1979 survey, which covered a region closer to Fogo and Twillingate, showed higher potential yield

with a range of 7-308 tonnes per year and an average of 112 tonnes per year (Development Branch Report No. 7).

In the Northwest coast region, the projected annual landing, based on 150 crab pots fished for 100 fishing days, would be, on the average, 20 tonnes with a range of 0 - 68 tonnes per year. 74% of the total catch in this area was of commercial size (Table 4).

Lower averages are postulated for the Southern Labrador and Placentia Bay regions. In the former area, where commercial crab represented 74% of the total catch, the predicted annual landing would be, on the average, 2 tonnes with a minimum of 0 tonnes per year and a maximum of 12 tonnes per year. This was based on 150 pots hauled over a period of 60 days (Table 6). The 1979 survey, conducted in a more southerly area from Change Islands to Square Islands, showed higher estimated yields with an average of 40 tonnes, a minimum of 16 tonnes and a maximum of 59 tonnes per year (Development Branch Report No. 7).

In the latter region, where commercial crab comprised only 21% of the total catch, the estimated annual landing, based on 150 crab pots fished for 150 days, would be on the average 18 tonnes with a range of 0-101 tonnes (Table 8).

Though only the Notre Dame Bay area showed estimated potential landings within the commercial fishing ranges, it would be unwise to reject the possibility of commercial fisheries in the other areas on the basis of the data collected. It must be noted that the survey values represent small sample sizes collected in specific regions over a limited amount of time. A

commercial enterprise would be expected to maximize landings by concentrating efforts in areas of highest yield. The aim of the survey is to indicate the presence or absence of the species in a particular area and to allow comparisons among areas studied. To estimate more definitively the feasibility of commercial fisheries in the four areas, more comprehensive studies would be required. One possibility would be the granting of conditional permits (as described by the Crab and Herring Licensing Committee, June, 1980 report) for the areas in question. Such permits would allow the holder to fish commercially in an area for a specific period of time while collaborating with the Department by supplying catch and effort information.

The survey points out specific problems connected with three of the areas. The low predicted landings for Southern Labrador are, in part, a result of the comparatively few fishing days realistically possible in this area. An additional problem is the lack of crab plants on the Labrador coast as it would be difficult to transport crab economically to an Island plant in a live state. However, crab processing licenses have recently been issued for Fox Harbour and Black Tickle, Labrador.

A similar problem exists on the Northwest coast region. Though commercial crabs constituted 74% of the total catch and shell width measuremeants show a high frequency of large crabs (Figures 15-17), the nearest processing plant is in the White Bay area.

In Placentia Bay, the quality of crab was comparatively poor suggesting that market value may be too low to support a commercial fishery. As well, the frequency of small crabs was high in comparison with the other areas, resulting in only 21% of the total catch being of commercial size (Figure 18).

Results from the St. Lewis Inlet study were favourable suggesting that crab fishing in more sheltered, inland sites may be a feasible venture for fishermen in the area. The yield from these sites would serve to supplement the regular catch which would be limited by the relatively short number of possible fishing days in the Labrador region. The main problem connected with this fishery would be the low air temperatures which would prevent the shipment of live crab to a processing plant.

In conclusion, only the Notre Dame Bay survey gave estimated yields suitable for commercial fishing but both the Northwest coast and Southern Labrador regions showed some potential as well.

ACKNOWLEDGEMENTS

In addition to the author, the following persons were involved in this project.

Government:

Jim Roberts, Assistant Project Officer
Department of Fisheries, St. John's, Newfoundland

Captain Sam Barbour, M.V. "Oderin"
Department of Fisheries, St. John's, Newfoundland

Overall project and final report reviewed by:
Dr. H. Squires, Director, Program Planning and Review
Department of Fisheries, St. John's, Newfoundland

And

Harold Murphy, Director, Fishing Operations Division
Department of Fisheries, St. John's, Newfoundland

Industry:

Captain Wes Parmiter, M.V. "Cindy Elizabeth"
Pt. Leamington, Notre Dame Bay, Newfoundland

Captain Gary Daley, M.V. "Lady Day"
St. Joseph's, St. Mary's Bay, Newfoundland

Quinlan Brother's Limited
St. Mary's, Newfoundland

REFERENCES

Hood, P.R., 1980 An Economic Assessment of the Newfoundland Crab Fishery, 1979. Economic Services Branch, Fisheries and Oceans, Newfoundland Region.

Hoyles, R., 1980. Exploratory Fishing for Snow Crab in Fortune Bay, Notre Dame Bay and Southern Labrador During 1979. Development Branch Report No. 7, Department of Fisheries, St. John's, Newfoundland.

Squires, H.J., 1965. Decapod Crustaceans of Newfoundland and Labrador and Canadian Eastern Artic. FRBC Manuscript Reports Series 810.

Thistle, W. (Chairman) 1980. Report of the Committee to Review the Existing Policy for the Licensing of the Crab Fishery and the Herring Fishery on the East and Northeast Coast of Newfoundland, Department of Fisheries & Oceans.

APPENDIX I

TABLES

Table 1: Catch of Snow Crab in Notre Dame Bay, June 11 - July 12, 1980.

Fishing Station	Date Hauled	No. of Pots	Depth Range (m)	Fishing Time (Days)	Total Catch (No.)	No. of Commercial Crabs	Average number of commercial Crabs per pot	No. of Under-sized Crabs	No. of Female Crabs	No. of Large Soft Crabs	No. of Under-sized Soft Crabs
1	June 11	49	144-216	1	545	306	6	237	1	0	1
6	12	49	216-360	1	291	204	4	81	0	2	4
7	13	49	324-342	1	669	628	13	41	0	0	0
3	14	41	270-324	1	506	437	11	68	0	1	0
2	17	40	306-338.4	1	387	345	9	39	0	3	0
4	18	48	187.2-293.4	1	540	402	8	76	0	53	9
5	19	56	201.6-324	1	1159	983	18	175	0	1	0
8	20	56	147.6-208.8	1	2987	2512	45	475	0	0	0
11	21	56	120.6-201.6	1	1174	832	15	276	0	47	19
10	22	56	158.4-192.6	1	1565	1038	19	501	1	15	10
9	23	56	185.4-198	1	437	289	5	146	0	1	1
13	24	56	201.6-262.8	1	1288	1001	18	280	0	5	2
14	25	56	162-352.8	1	567	321	6	232	0	13	1
15	26	56	324-349.2	1	447	413	7	30	4	0	0
16	30	56	298.8-320.4	4	871	861	15	10	0	0	0
17	July 1	56	338.4-352.3	2	956	929	17	27	0	0	0
21	3	56	327.6-331.2	1	17	14	0	3	0	0	0

TABLE 1: (Continued)

Fishing Station	Date Hauled	No. of Pots	Depth Range (M)	Fishing Time (Days)	Total Catch (No.)	No. of Commercial Crabs	Average No. of Commercial Crabs Per Pot	No. of Under-Sized Crabs	No. of Female Crabs	No. of Large Soft Crabs	No. of Under-Sized Soft Crabs
20	July 4	56	266.4-295.2	1	86	41	1	43	0	0	2
23	5	56	304.2-320.4	1	4	1	0	3	0	0	0
24	6	56	309.6-322.2	1	0	0	0	0	0	0	0
18	7	56	153-212.4	1	275	135	2	98	0	24	18
19	8	56	144-167.4	1	544	278	5	235	0	25	6
22	9	56	136.8-149.4	1	574	308	6	242	0	13	11
25	11	56	181.8-223.2	2	186	91	2	59	0	21	15
12	12	56	144-216	1	846	465	8	368	0	11	2
TOTALS		1340	121-360	30	16.921	12834	Avg. 10	3745	6	235	101

TABLE 2: Commercial Crab Fishery Potential in Notre Dame Bay extrapolated from exploratory catch rates, 1980.

Fishing Station	% Comm.	Avg. No. comm. per pot	average wgt. per pot (kg)[1]	Hypothetical amt. per area for 150 pots[2] hauled/day (kg)	Potential yearly landings for 150 fishing days[3] (tonne)
1	56	6	2.7	405	61
6	70	4	1.8	270	41
7	94	13	5.8	878	132
3	86	11	4.9	743	111
2	89	9	4.1	608	91
4	74	8	3.6	540	81
5	85	18	8.1	1215	182
8	84	45	20.2	3038	456
11	71	15	6.8	1013	152
10	66	19	8.6	1283	192
9	66	5	2.2	338	51
13	78	18	8.1	1215	182
14	57	6	2.7	405	61
15	92	7	3.2	473	71
16	99	15	6.8	1013	152
17	97	17	7.6	1148	172
21	82	0	0	0	0
20	48	1	0.4	68	10
23	25	0	0	0	0
24	0	0	0	0	0
18	49	2	0.9	135	20
19	51	5	2.2	338	51
22	54	6	2.7	405	61
25	49	2	0.9	135	20
12	55	8	3.6	540	81
Total 25	76% avg.	10 avg.	4.3	16,206	2431
					avg. 97

1. Based on .45 kg per crab.

2. Average number of crab pots hauled per day by commercial crab fishermen (Hood 1979).

3. Number of possible fishing days estimated by Departmental staff.

Table 3: Catch of Snow Crabs, NOrthwest Coast, July 18 - August 5, 1980.

Fishing Station	Date Hauled	No. of Pots	Depth Range (M)	Fishing Time (Days)	Total Catch (No.)	No. of Commercial Crabs	Average number of Commercial Crabs per pot	No. of Under-sized Crabs	No. of Female Crabs	No. of Large Soft Crabs	No. of Under-sized soft crabs
1	July18/21	56	169.2-261	1	593	453	8	95	0	35	10
3	21	32	108-147.6	4	5	5	0	0	0	0	0
6	22	56	144-320.4	1	693	561	10	106	0	22	4
7	23	56	147.6-228.6	1	93	11	0	82	0	0	0
15	24	56	185.4-241.2	1	133	67	1	51	0	15	0
14	25	56	223.2-284.4	1	200	144	3	52	1	[illegible]	0
13	28	56	252-262.8	3	147	134	2	13	0	0	0
12	29	56	252-288	1	15	15	0	0	0	0	0
8	30	56	162-262.8	1	1	0	0	1	0	0	0
11	July 31 - August 1	56	180-252	2	168	94	2	71	1	0	2
10	2	24	100.8-226.8	2	16	7	0	7	1	0	1
9	2	32	180-252	1	135	50	2	84	1	0	0
4	3	56	136.8-291.6	1	408	380	7	28	0	0	0
5	4	56	235.8-288	1	304	230	4	72	0	1	1
2	5	56	198-243	1	155	111	2	43	1	0	0
Total		760	100-320	22	3066	2262	Avg. 3	705	5	76	18

Table 4: Commercial Crab Fishery Potential of the Northwest Coast extrapolated from exploratory catch rates, July 18 - August 5, 1980.

Fishing Station	% Comm.	Avg. No. of Comm. per pot	Average wgt. per pot (kg) [1]	Hypothetical amt. per area for 150 pots [2] hauled/day (kg)	Potential yearly landings for 100 fishing days [3] (tonne
1	76	4	3.6	540	54
3	100	2	0.9	135	14
6	81	10	4.5	675	68
7	12	2	0.9	135	14
15	50	1	0.4	68	7
14	72	3	1.4	203	20
13	91	2	0.9	135	14
12	100	0	-	-	-
8	0	0	-	-	-
11	56	2	0.9	135	14
10	44	0	-	-	-
9	37	2	0.9	135	14
4	93	7	3.2	473	47
5	76	4	1.8	270	27
2	72	2	0.9	135	14
Total 15	74	Avg. 3	Avg. 1.4	3039	307

1. Based on .45 kg per crab.

2. Average number of crab pots hauled per day by commercial crab fishermen (Hood, 1979).

3. Estimated number of possible fishing days in Northwest Coast region (Mr. Joe Kennedy, Regional Representative, Provincial Department of Fisheries, Great Northern Peninsula).

Table 5: Catch of Snow Crab in Southern Labrador, August 23 - September 8, 1980.

Fishing Station	Date Hauled	No. of Pots	Depth Range (M)	Fishing Time (Hrs.)	Total Catch (No.)	No. of Commercial Crabs	Average number of Commercial Crabs per pot	No. of Under-sized Crabs	No. of Female Crabs	No. of Large Soft Crabs	No. of Under-sized Soft Crabs
4	Aug. 23	40	207-216	14	33	12	0	15	2	0	4
2	28	56	248.4-315	45	202	177	3	25	0	0	0
5	26	56	207-237.6	54	16	11	0	5	0	0	0
1	Sept. 1	56	208.8-237.6	91	4	2	0	2	0	0	0
3	2	56	205.2-219.6	18½	30	10	0	20	0	0	0
6	8		180-212.4	140	29	19	0	10	0	0	0
Totals		312	180-315	362.5	314	231		77	2	0	4
							Avg. 1				

Table 6: Commercial Crab Fishery potential, Southern Labrador extrapolated from exploratory survey catch rates, August 23 to September 7, 1980

Fishing Station	% Comm.	Average no. Comm. per pot	Average wgt.[1] per pot (kg)	Hypotetical amount per fishing station for 150 pots[2] hauled/day (kg)	Potential yearly landings for 60 fishing days[3] (tonne)
1	50	-	-	-	-
2	88	3	1.4	203	12
3	33		-	-	-
4	39	-	-	-	-
5	69	-	-	-	-
6	66	-	-	-	-
Totals	74%	Avg.1	Avg.0.2	203	12
					Avg 2

1. Based on .45kg per crab.

2. Average number of crab pots hauled per day by commercial crab fishermen (Hood, 1979).

3. Estimated number of possible fishing days in Southern Labrador region. (Mr. Joe Kennedy, Regional Representative Provincial Department of Fisheries, Great Northern Peninsula).

Table 7: Catch of Snow Crabs from Placentia Bay, November 18 - December 8, 1980.

Fishing Station	Date Hauled	No. of Pots	Depth Range (M)	Fishing Time (Hrs.)	Total Catch (No.)	No. of Commercial Crabs	Average number of Commercial Crabs per pot	No. of Under-sized Crabs	No. of Female Crabs	No. of Large Soft Crabs	No. of Under-sized Crabs
1	No. 18	178	-	-	1,181	203	6	934	0	10	34
3	21	178	169.2-190.8	19	885	342	10	490	1	29	23
6	22	178	180-190.8	19	726	79	2	632	1	3	10
2	24	176	162-225	48	0	0	-	0	0	0	0
4	25	175	208.8-230.4	18	319	18	1	296	0	1	4
7	26	175	153-162	18	487	68	2	411	1	4	3
12	Dec. 1	175	198-212.4	143	215	74	2	133	1	5	3
5	2	172	162-216	19	4	2	-	2	0	0	0
8	3	171	207-216	19	1	1	-	0	0	0	0
9	6	116	162-180	71	0	0	0	0	0	0	0
11	6	56	180-187.2	68	1	0	0	1	0	0	0
10	8	53	187.2-187.2	47	1	0	0	1	0	0	0
15	8	108	187.2-207	-	1	0	0	1	0	0	0
Totals		1911		489	3,821	787	Avg. 2	2901	4	52	77

Table 8: Commercial crab fishery potential, Placentia Bay extrapolated from exploratory survey catch rates, November 18 - December 8, 1980.

Fishing Station	No. of Boxes of Large Crabs	No. of Boxes of Small Crabs	Wgt. of Large Crabs at 50kg/box	Wgt. of Small Crabs at 50kg/box	% Commercial Crab per pot	Average number of Commercial Crabs per pot	Avg. wgt.[1] Avg. wgt. per pot (kg)	Hypothetical amt. per area for 150 pots[2] hauled/ day (kg)	Potential Yearly Landings for 150 fishing days[3] (tonne)
1	11	46	247.5	1035	19.29	6	2.7	405	61
2	0	0	0	0	0	-	-	-	-
3	38	24	855	540	61.29	10	4.5	675	101
4	7	11	146	247.5	37	1	0.4	68	10
5	0	0	0	0	0	-	-	-	-
6	11	26	247.5	585	30	2	0.9	135	20
7	9	22	202.5	495	29	2	0.9	135	20
8	0	0	0	0	0	-	-	-	-
9	0	0	0	0	0	-	-	-	-
10	0	0	0	0	0	-	-	-	-
11	0	0	0	0	0	-	-	-	-
12	9	11	202.5	247.5	45	2	0.9	135	20
15	0	0	0	0	0	-	-	-	-
Totals	45	140	1901	3150	221.58	Avg. 2	Avg 0.8	1553	232
									Avg. 18

1. Based on .45kg per crab.
2. Average number of crab pots hauled per day by commercial crab fishermen (Hood, 1979).
3. Number of possible fishing days estimated by Departmental staff.

Table 9: Catch of Snow Crabs, through the ice, St. Lewis Inlet, Labrador, 1980.

Date Hauled	No. of Pots	Fishing Days	Total Catch	No. Commercial Crabs	Average Commercial Crabs per pot	Average weight per pot (kg)[1]	No. of Under-sized Crabs
Feb.27	5	1	5	5	1	0.5	0
28	5	1	2	1	-	0	1
Mar. 3	5	4	49	48	10	4.5	1
4	5	1	29	29	6	2.7	0
Apr. 8	5	1	6	6	1	0.5	0
11	5	3	3	3	1	0.5	0
Totals	30	11	94	92	Avg. 3	Avg. 1.5	2

1. Based on .45kg. per Crab.

Table 10: Bottom temperatures and station depths recorded during the Snow Crab Survey in Placentia Bay; November 18 - December 8, 1980.

Station No.	Date	Bottom Temperature $0^{o}C$	Station Depth (M)
1	Nov. 18	-0.9	196.2
3	21	-0.1	190.8
6	22	-0.2	190.8
2	24	-0.4	208.8
4	25	-0.7	194.4
7	26	-0.6	201.6
12	Dec. 1	-0.2	207
5	2	+0.4	176.4
8	3	-0.7	207
9	6	-0.7	180
11	6	-	-
10	8	-	-
15	8	-	-

Table 11: Bottom temperatures and station depths taken during the Snow Crab Survey, Southern Labrador; August 23 - September 8, 1980.

Station No.	Date	Bottom Temperature $0^{o}C$	Station Depth Range (M)
4	Aug. 23	-	207-217.8
2	28	-	248.4-315
5	26	-	207-237.6
4	Sept. 1	-0.9	205.2-219.6
3	2	-0.9	205.2-219.6
6	8	-	180-272.4

Table 12: Bottom temperatures and station depths recorded during the Snow Crab Survey on the Northwest Coast; July 18 - August 5, 1980.

Station No.	Date	Bottom Temperature ^{o}C	Station Depth (M)
1	July 21	5.3	187.2
3	21	-1	147.6
6	22	3.1	201.6
7	23	-3	147.6
15	24	-1	187.2
14	25	5.2	57.6
13	28	1.1	262.8
12	29	-2	273.6
8	30	-	-
11	31	-	-
9	Aug. 1	-	-
10	2	2.5	171
4	3	5.7	280.6
5	4	4.2	234
2	5	4.5	237.6

APPENDIX 2

FIGURES USED IN TEXT

Figure 1: Survey Areas for Snow Crab in 1980 (Newfoundland.)

Figure 2: Survey areas for Snow Crab in 1980 (Labrador).

Figure 3: Hauling crab pots onboard the M.V. "Cindy Elizabeth" during the Notre Dame Bay Survey, 1980

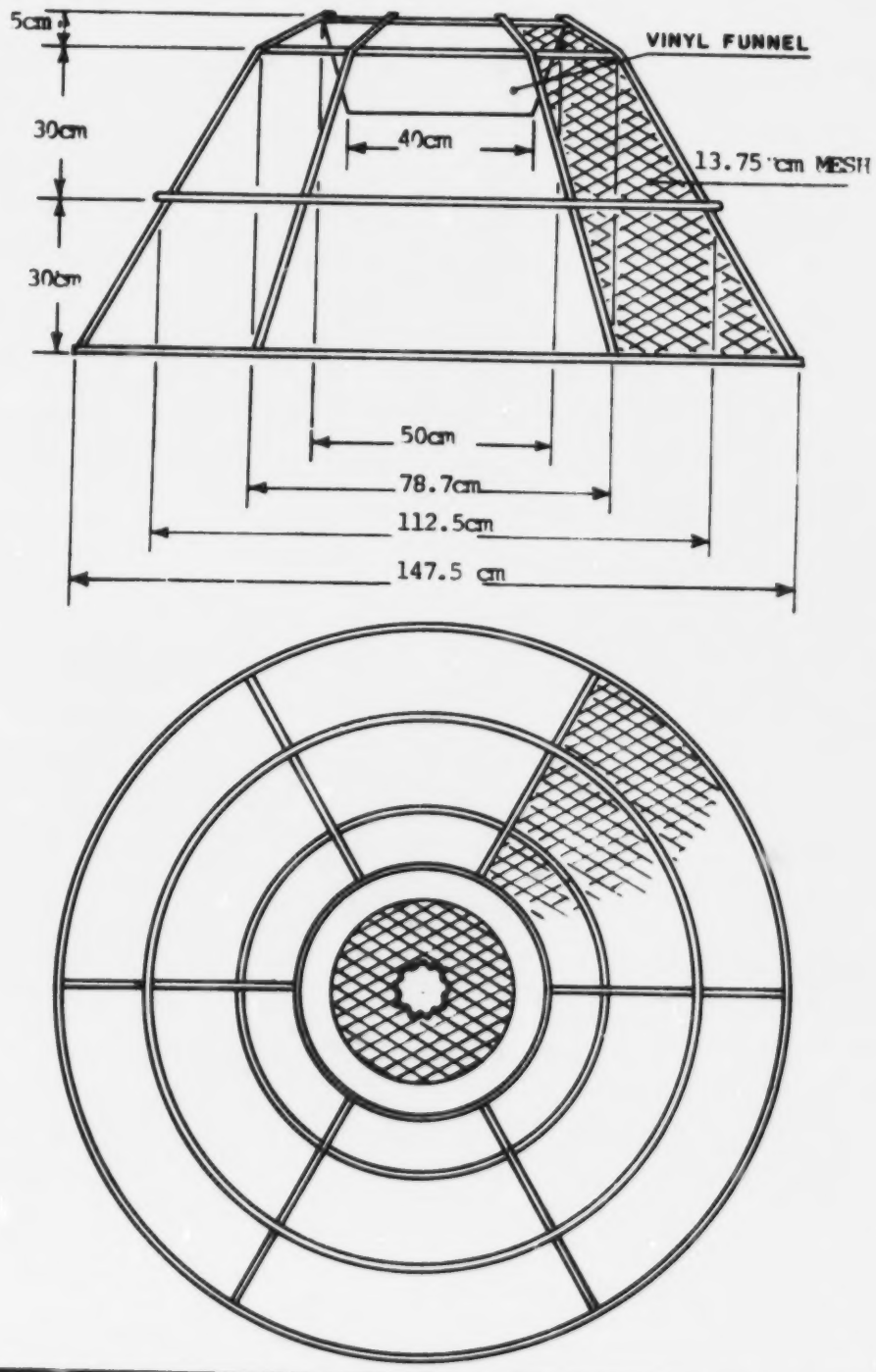

Figure 4: A typical conical pot used in the Newfoundland Snow Crab Fishery.

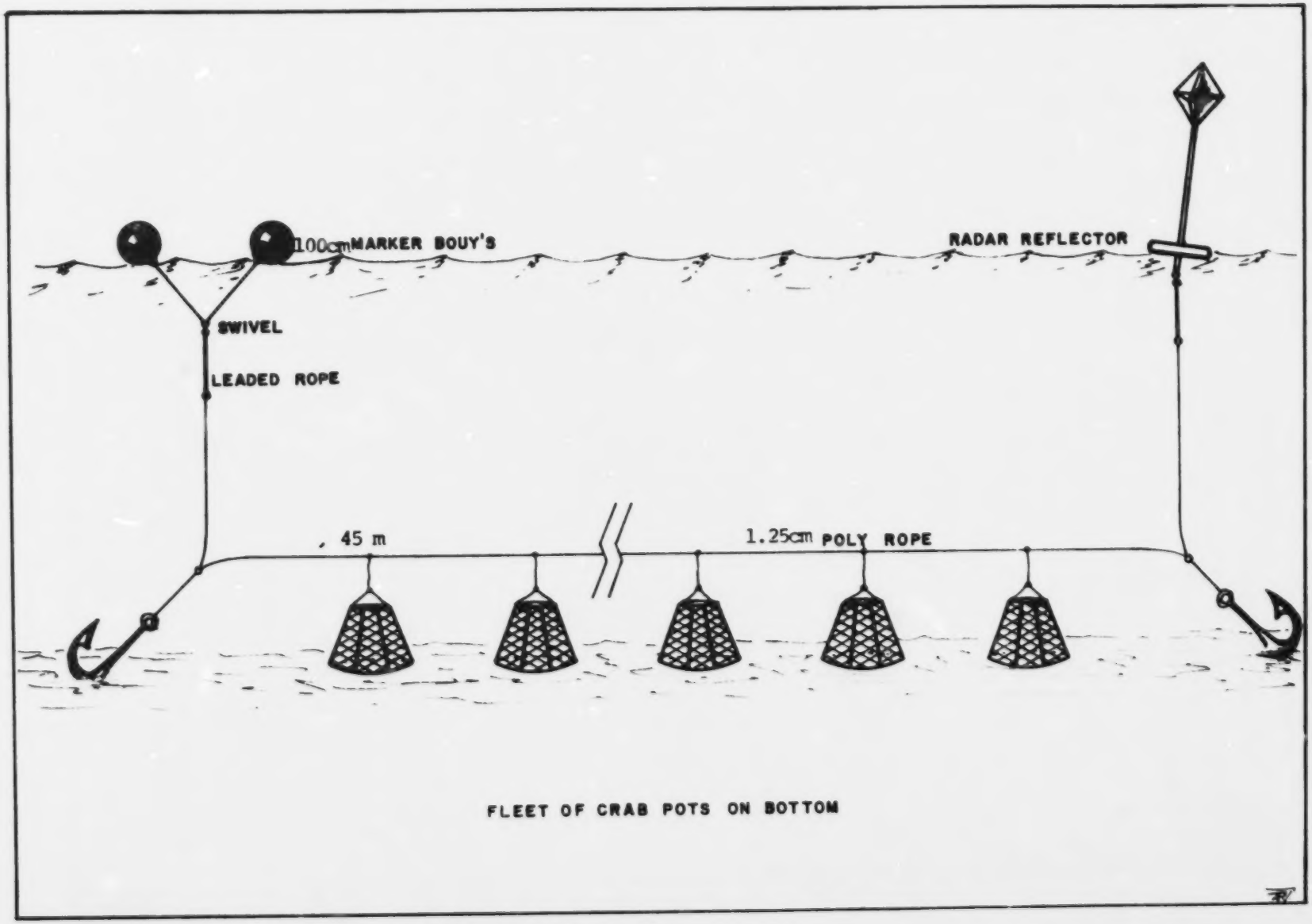

Figure 5: Conical crab pots in set position.

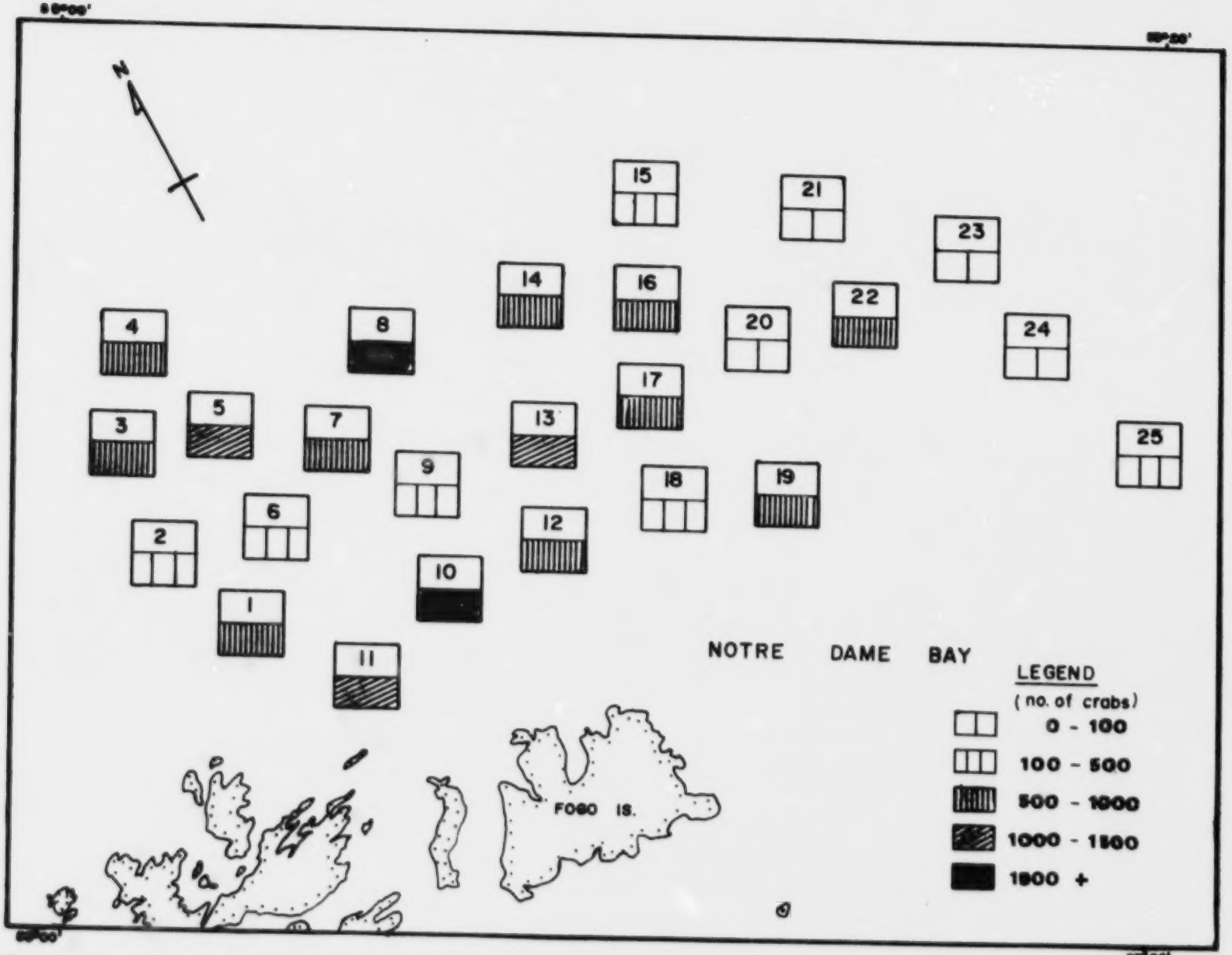

Figure 6: Snow Crab survey results in Notre Dame Bay in 1980, (total catch per station, fishing an average of 45 pots per day.)

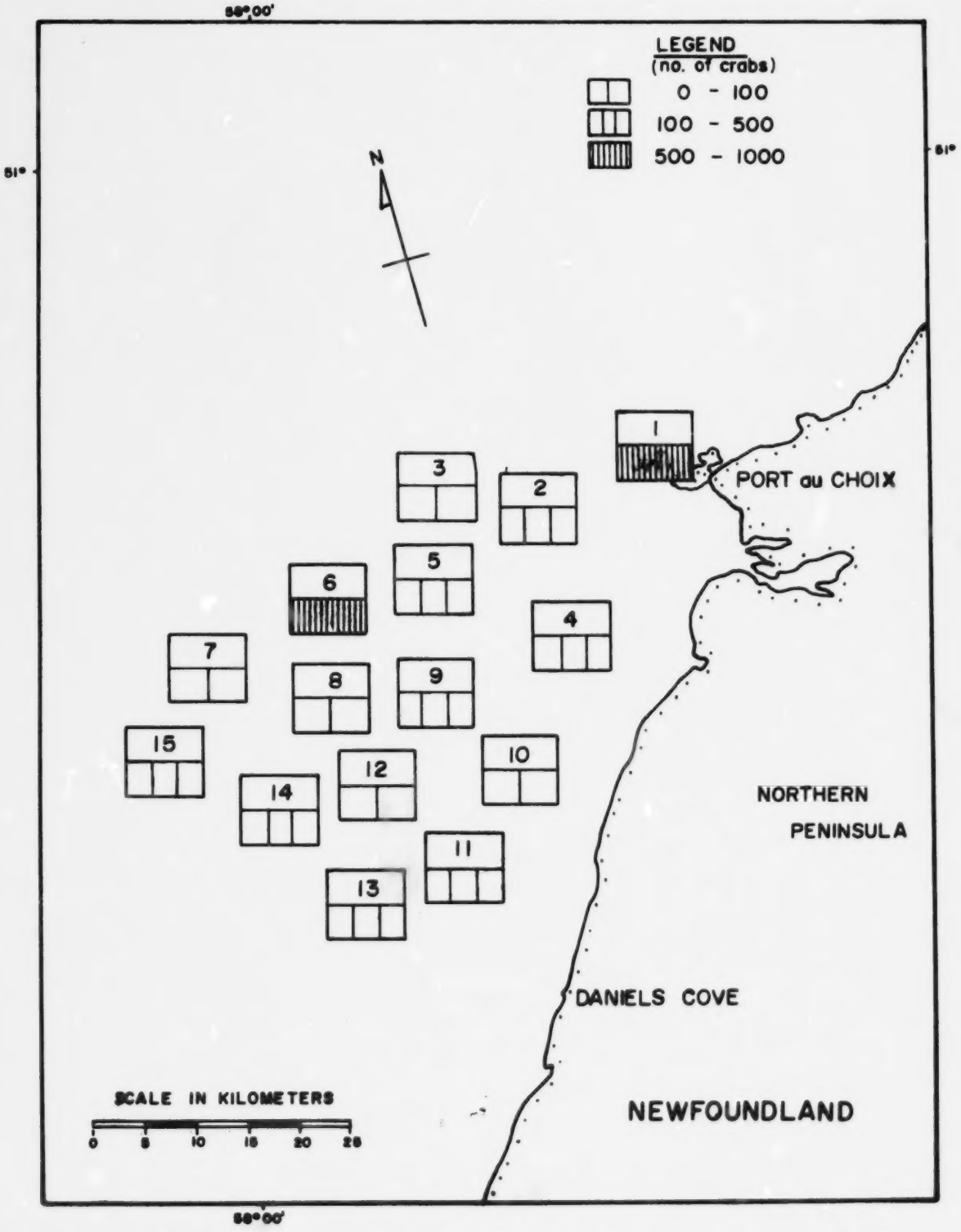

Figure 7: Snow Crab survey results off the Northwest Coast of Newfoundland in 1980,(total catch per station, fishing an average of 35 pots per day.)

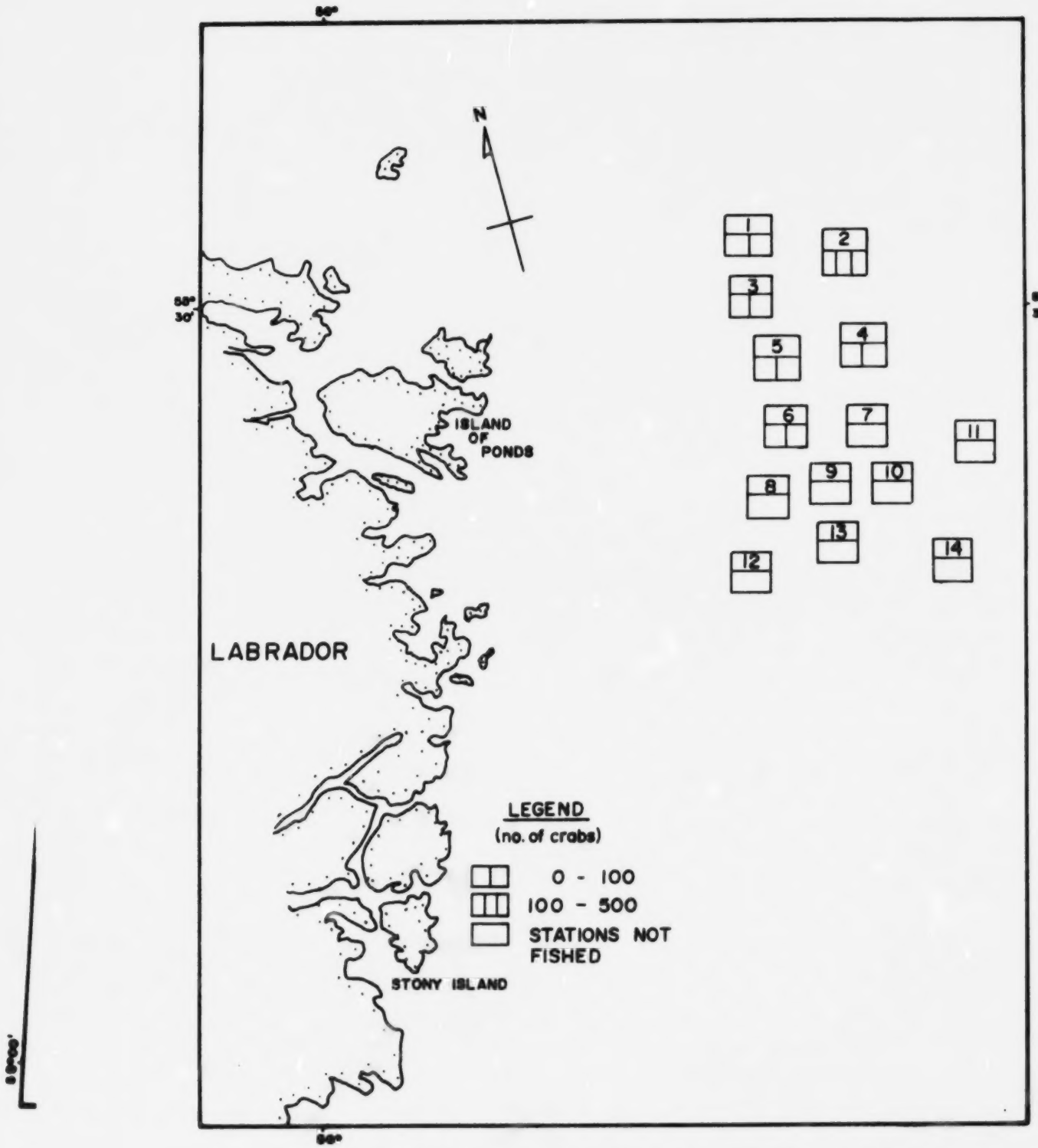

Figure 8: Snow Crab survey results in Southern Labrador in 1980, (total catch per station, fishing an average of 12 pots per day.)

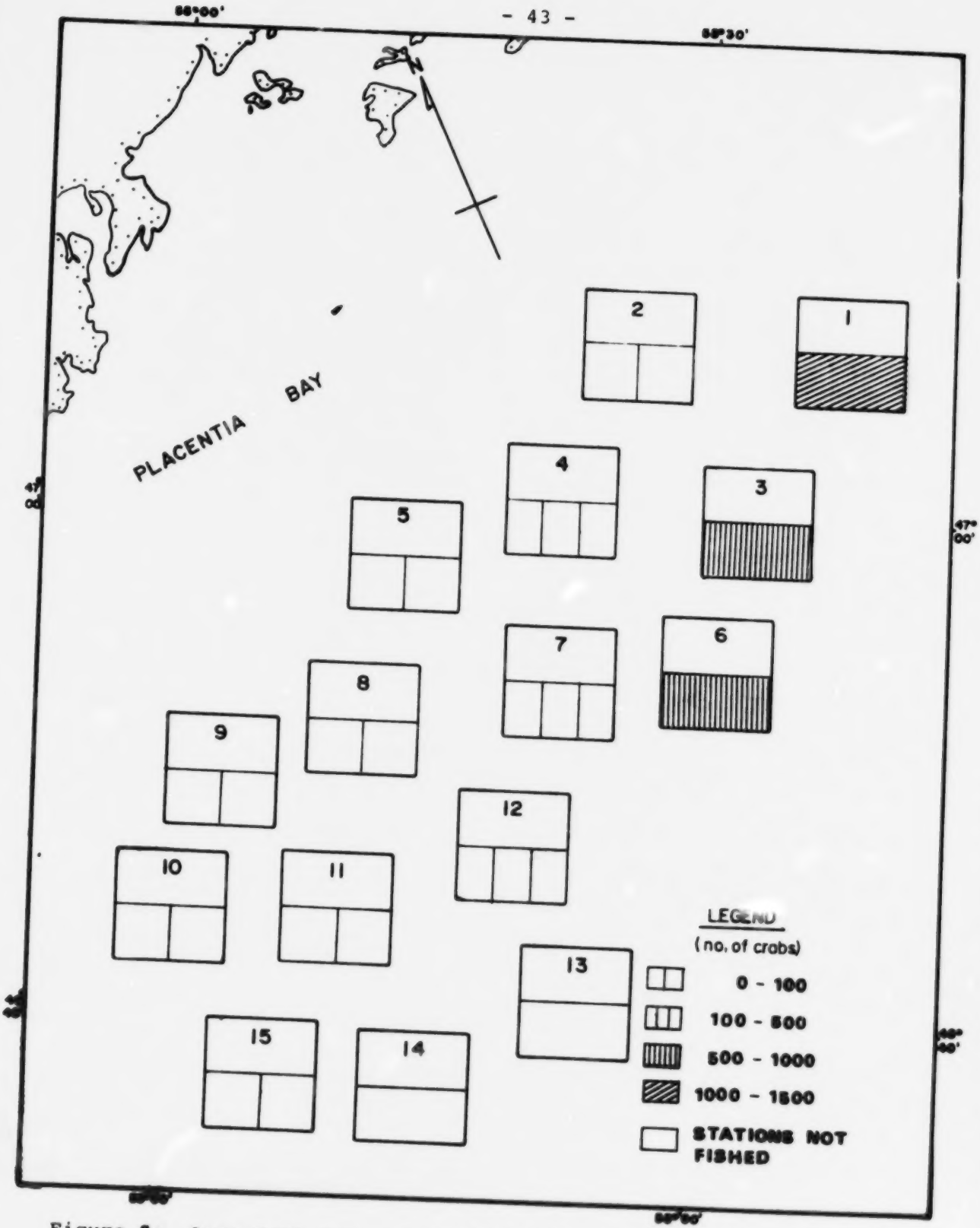

Figure 9: Snow Crab survey results in Placentia Bay in 1980, (total catch per station, fishing an average of 72 pots per day.)

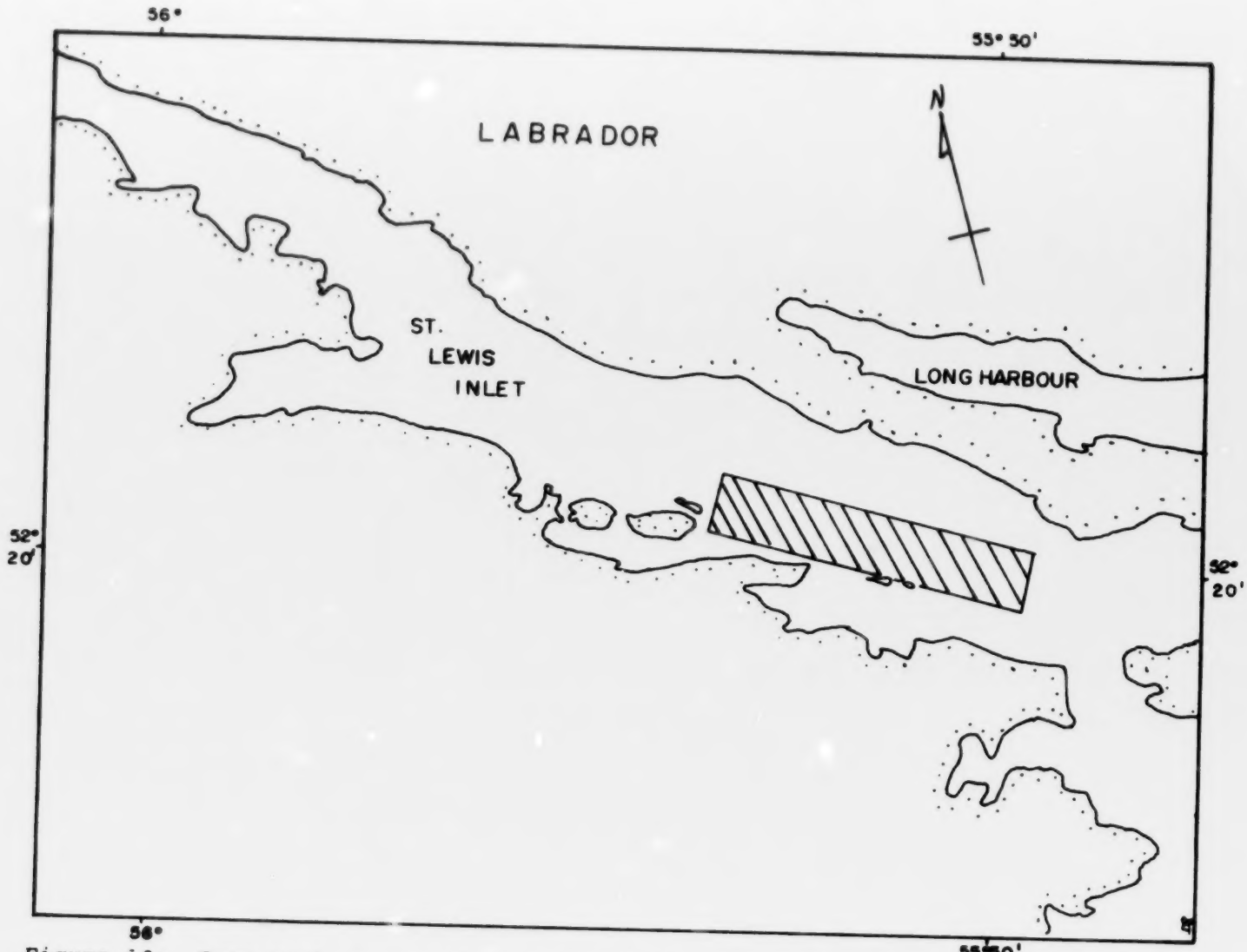

Figure 10: Snow Crab survey area in St. Lewis Inlet, Labrador, 1980

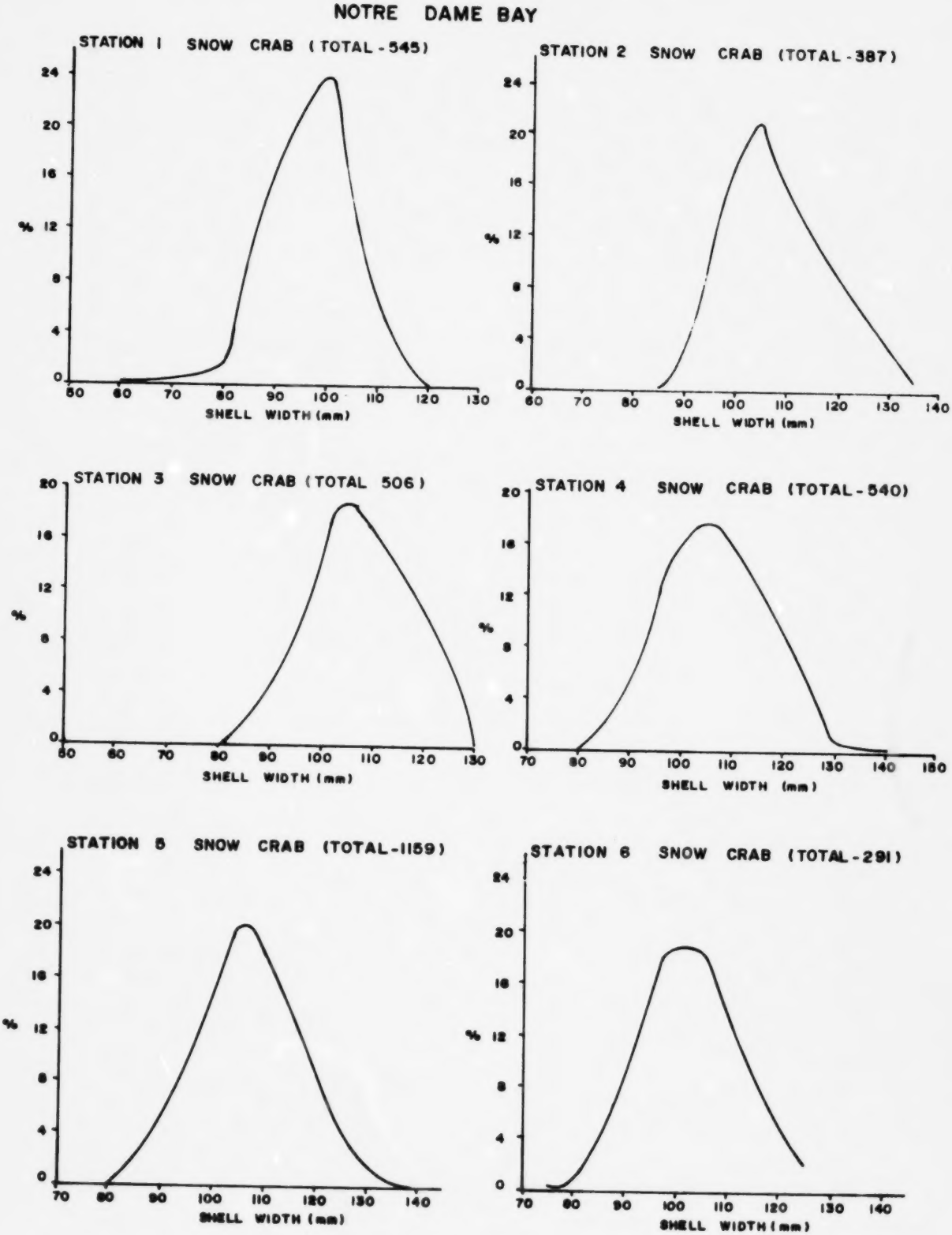
NOTRE DAME BAY
STATION 1 SNOW CRAB (TOTAL-545)
STATION 2 SNOW CRAB (TOTAL-387)
STATION 3 SNOW CRAB (TOTAL 506)
STATION 4 SNOW CRAB (TOTAL-540)
STATION 5 SNOW CRAB (TOTAL-1159)
STATION 6 SNOW CRAB (TOTAL-291)
%
SHELL WIDTH (mm)

Figure 11: Width frequencies of Snow Crabs from survey catches in Notre Dame Bay in 1980 (Stations 1-6).

NOTRE DAME BAY

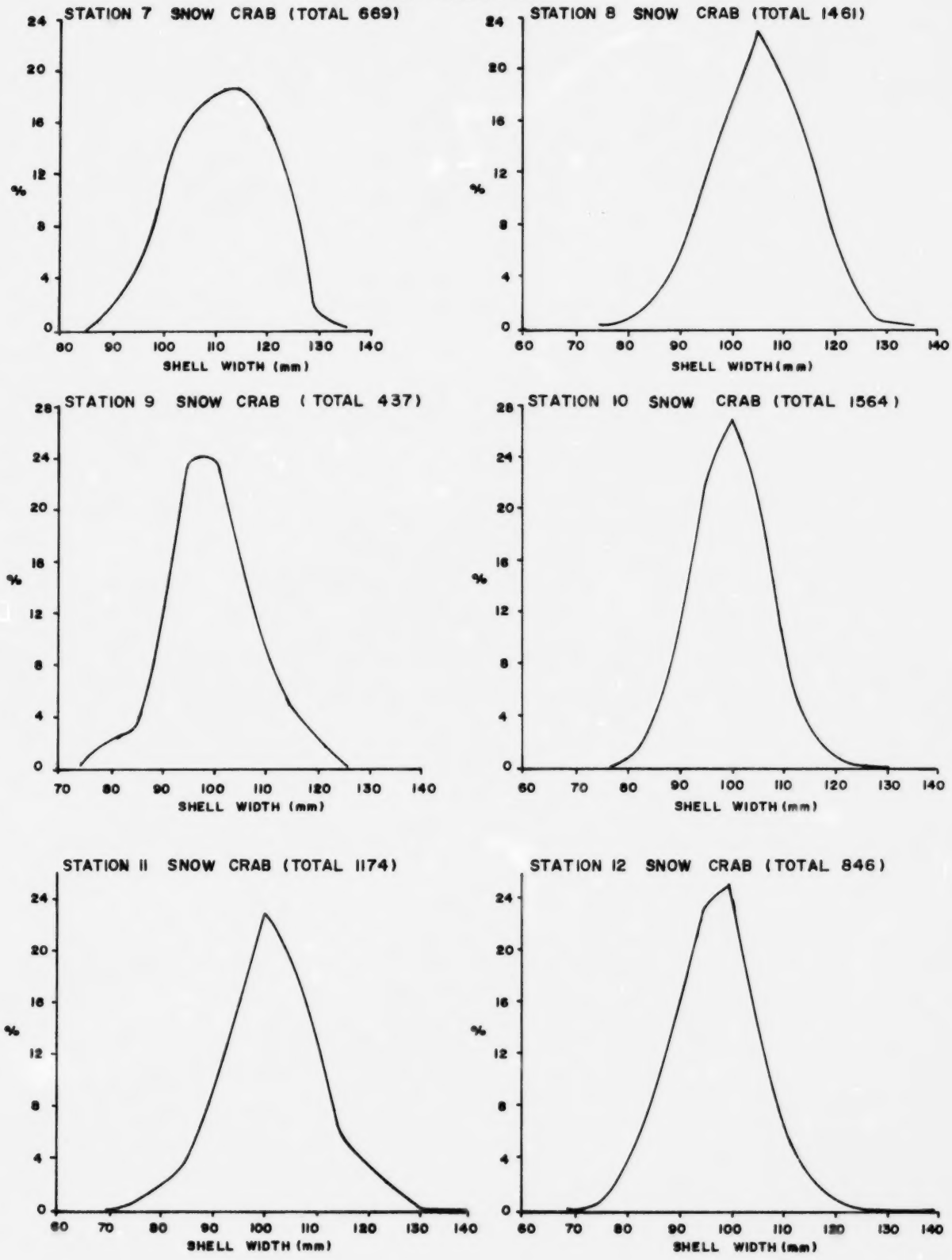
STATION 7 SNOW CRAB (TOTAL 669)
STATION 8 SNOW CRAB (TOTAL 1461)
STATION 9 SNOW CRAB (TOTAL 437)
STATION 10 SNOW CRAB (TOTAL 1564)
STATION 11 SNOW CRAB (TOTAL 1174)
STATION 12 SNOW CRAB (TOTAL 846)
%
SHELL WIDTH (mm)

Figure 12: Width frequencies of Snow Crabs from survey catches in Notre Dame Bay in 1980 (Stations 7-12).

NOTRE DAME BAY

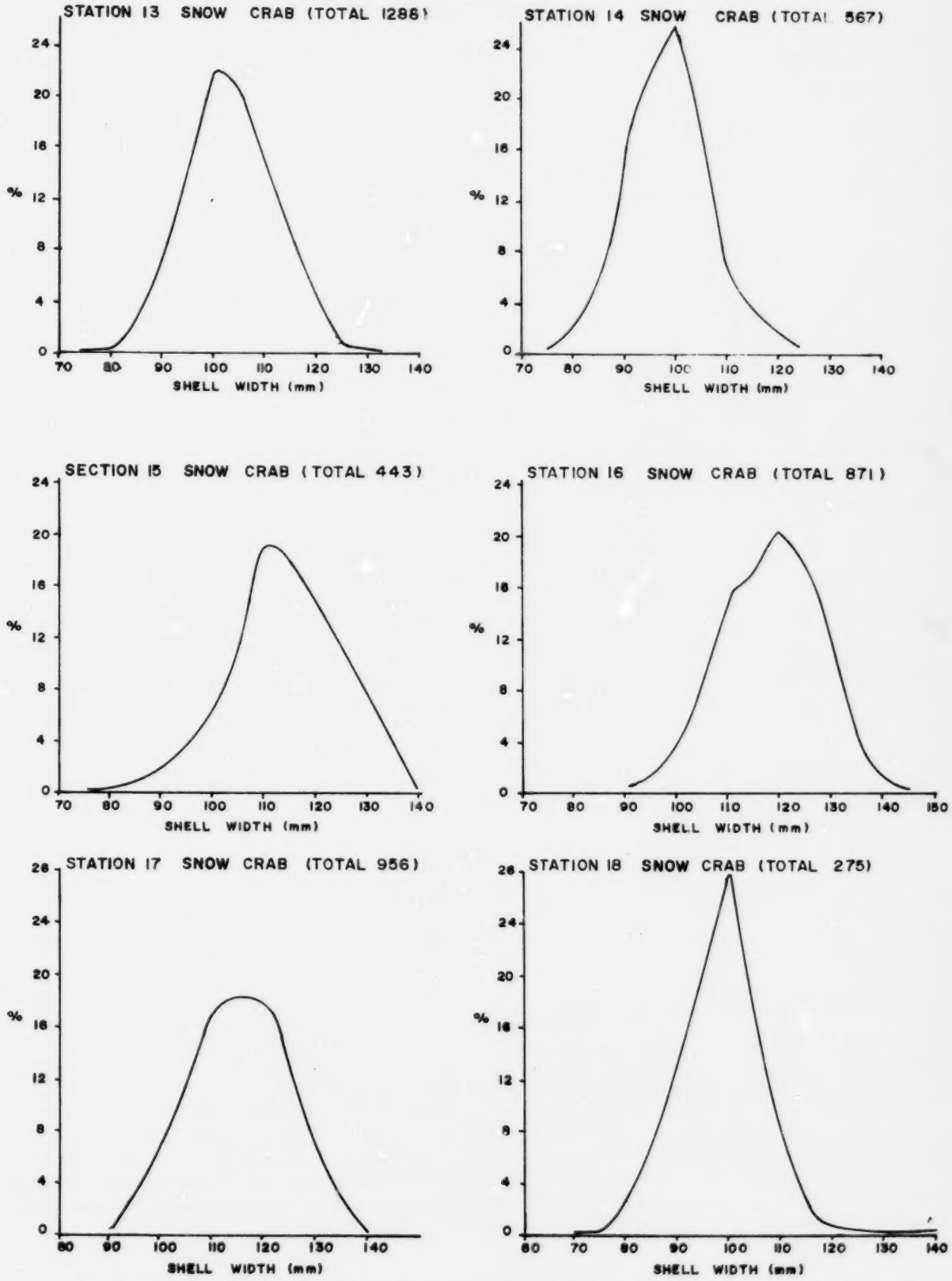
STATION 13 SNOW CRAB (TOTAL 1288)
STATION 14 SNOW CRAB (TOTAL 567)
SECTION 15 SNOW CRAB (TOTAL 443)
STATION 16 SNOW CRAB (TOTAL 871)
STATION 17 SNOW CRAB (TOTAL 956)
STATION 18 SNOW CRAB (TOTAL 275)
%
SHELL WIDTH (mm)

Figure 13: Width frequencies of Snow Crabs from survey catches in Notre Dame Bay in 1980 (Stations 13-18).

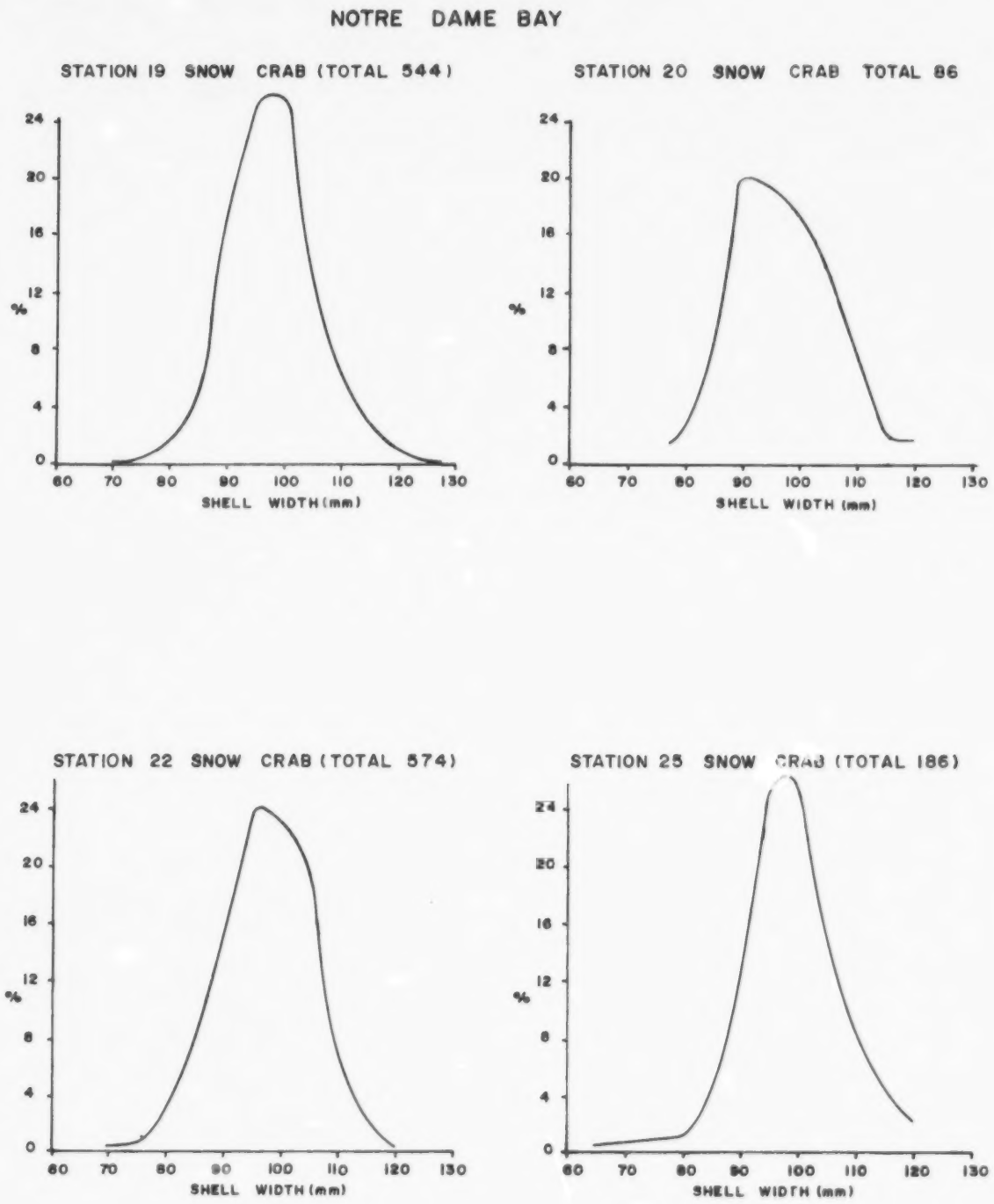

Figure 14: Width frequencies of Snow Crabs from Survey catches in Notre Dame Bay in 1980 (Stations 19,20,22 and 25).

NORTH WEST COAST

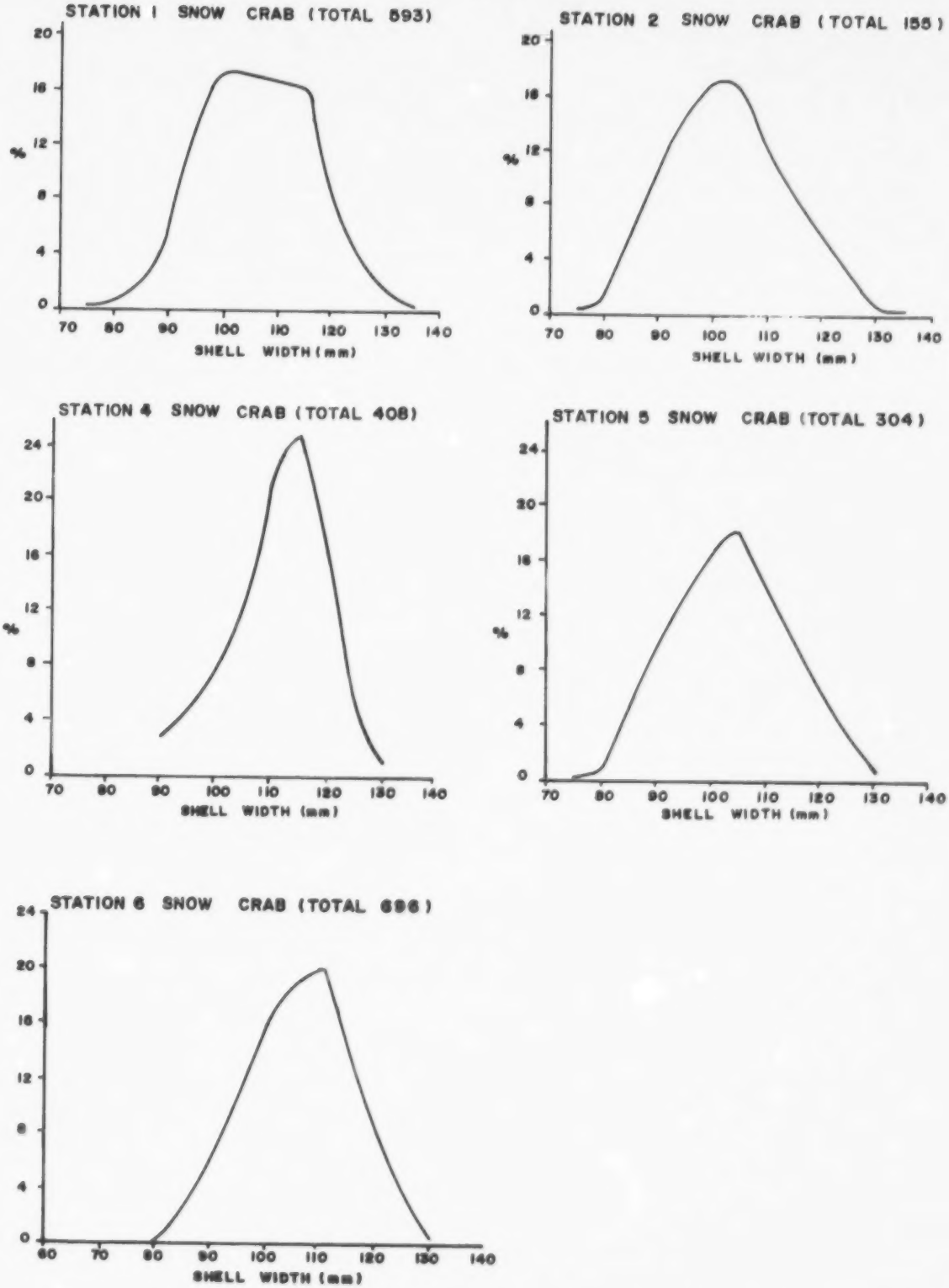
STATION 1 SNOW CRAB (TOTAL 593)
STATION 2 SNOW CRAB (TOTAL 155)
STATION 4 SNOW CRAB (TOTAL 408)
STATION 5 SNOW CRAB (TOTAL 304)
STATION 6 SNOW CRAB (TOTAL 696)
%
SHELL WIDTH (mm)

Figure 15· Width frequencies of Snow Crabs from survey catches off the Northwest Coast in 1980 (Stations 1,2 and 4-6).

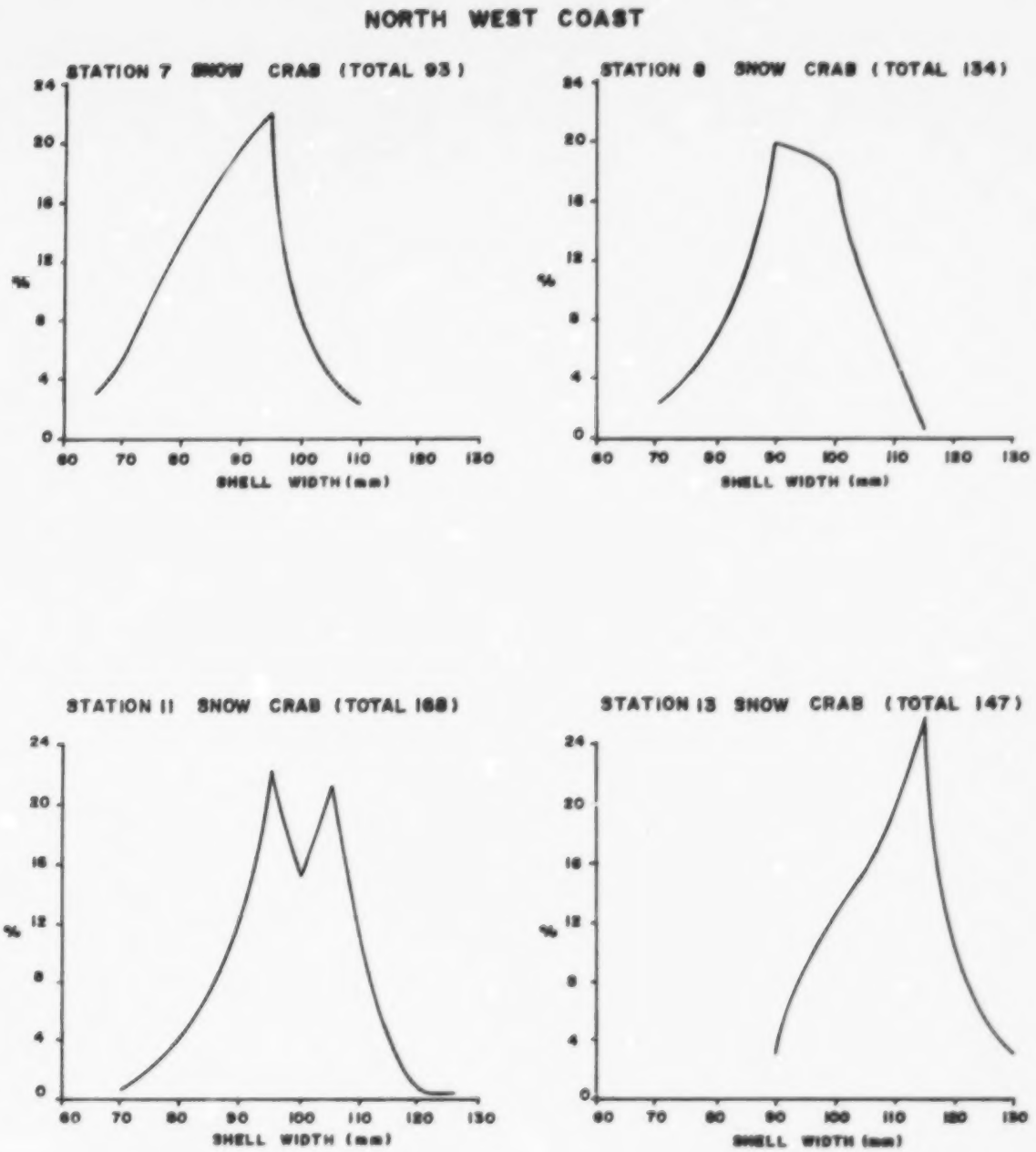
NORTH WEST COAST
STATION 7 SNOW CRAB (TOTAL 93)
STATION 8 SNOW CRAB (TOTAL 134)
STATION 11 SNOW CRAB (TOTAL 168)
STATION 13 SNOW CRAB (TOTAL 147)
%
SHELL WIDTH (mm)

Figure 16. Width frequencies of Snow Crabs from survey catches off the Northwest Coast in 1980 (Stations 7,8,11 and 13).

NORTH WEST COAST

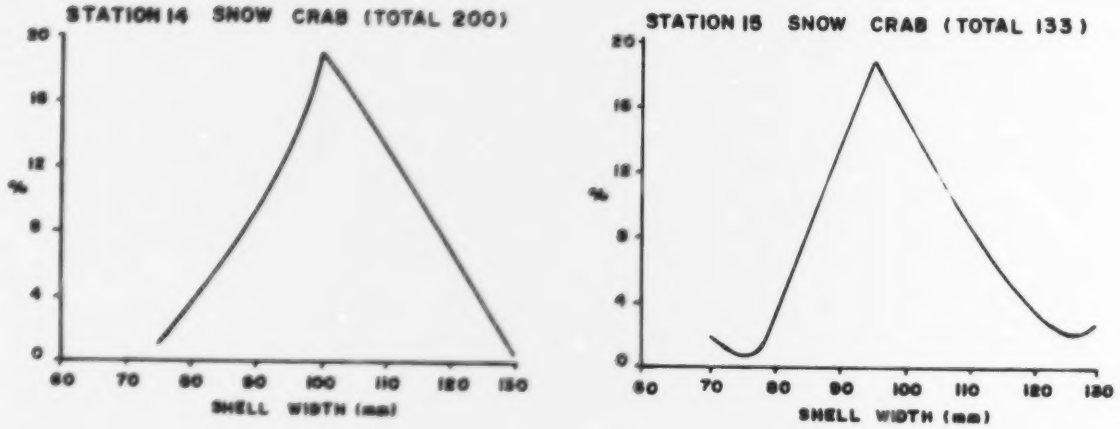

Figure 17: Width frequencies of Snow Crabs from survey catches off the Northwest Coast in 1980 (Stations 14, 15).

SOUTHERN LABRADOR

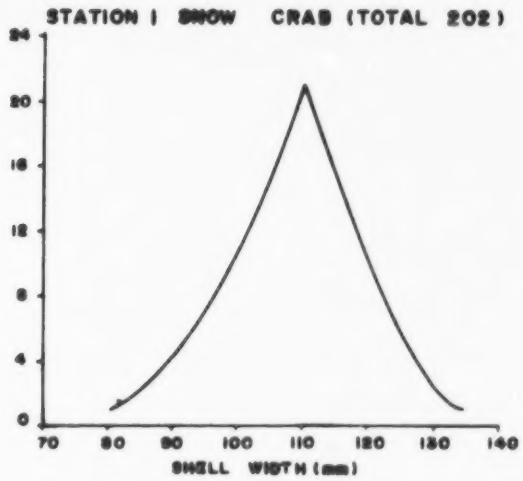

Figure 18: Width frequencies of Snow Crabs from survey catches off Labrador in 1980 (Station 1).

PLACENTIA BAY

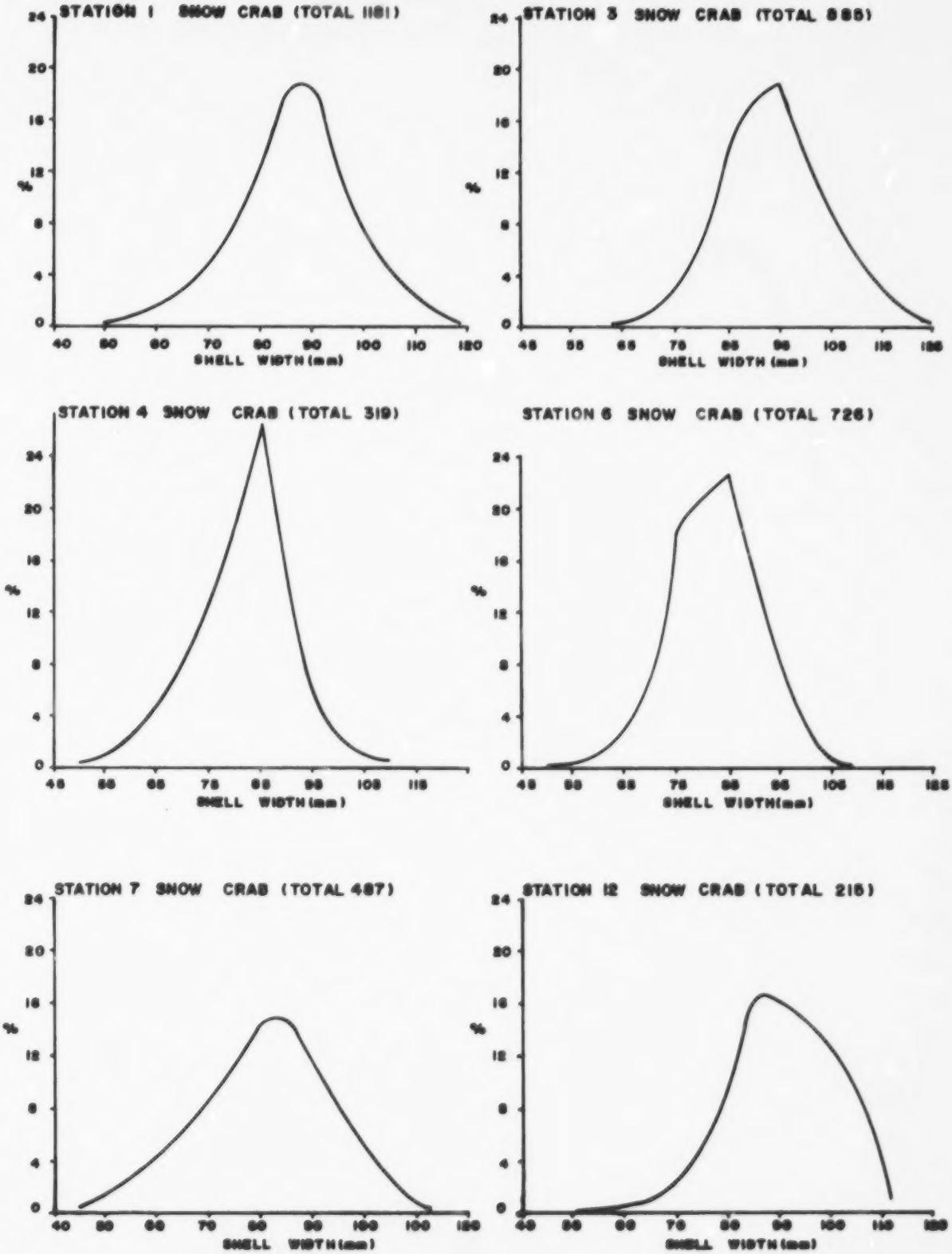
STATION 1 SNOW CRAB (TOTAL 1181)
STATION 3 SNOW CRAB (TOTAL 885)
STATION 4 SNOW CRAB (TOTAL 319)
STATION 6 SNOW CRAB (TOTAL 726)
STATION 7 SNOW CRAB (TOTAL 487)
STATION 12 SNOW CRAB (TOTAL 215)
%
SHELL WIDTH (mm)

Figure 19: Width frequencies of Snow Crabs from survey catches in Placentia Bay in 1980 (Stations 1,3,4,6,7, and 12).

SECTION TWO

Government of Newfoundland and Labrador

Department of Fisheries

Exploratory Fishing For Snow Crabs in Southern Labrador During 1981

Development Branch Report No. 23

February, 1982

Exploratory Fishing for Snow Crab in Southern Labrador During 1981

Project Co-ordinator: Robert Hoyles

Report by

Robert Hoyles

and

Norah Lee

Fishing Operations Unit, Development Branch

Department of Fisheries

St. John's, Newfoundland

TABLE OF CONTENTS

	Page
List of Tables	i
List of Figures	ii
INTRODUCTION	1
SURVEY METHODS AND MATERIALS	2
Survey Vessel	2
Survey Plan	2
Recorded Data	3
Fishing Gear	3
RESULTS	4
WATER TEMPERATURES	5
DISCUSSION	6
CONCLUSION	7
ACKNOWLEDGEMENTS	8
REFERENCES	9
APPENDIX I	10
APPENDIX II	14
APPENDIX III	18

LIST OF TABLES

		Page
Table 1:	Catch of Snow Crab in Southern Labrador	10
Table 2:	Catch of Snow Crab through the ice, St. Lewis Inlet, Labrador, 1981	11
Table 3:	Bottom Temperatures and Transect Line Depth Recorded During 1981 Snow Crab Survey	12

LIST OF FIGURES

		Page
Figure 1:	Transect Lines for 1981 Snow Crab Survey	14
Figure 2:	Survey Area with Top Catch Results	15
Figure 3:	Snow Crab Survey Area in St. Lewis Inlet, Labrador, 1981	16

INTRODUCTION

During 1979 and 1980, the Department of Fisheries conducted surveys for snow crab (Chinocetes opilio) along the Labrador Coast. Although these surveys found snow crab in varying quantities, it was deemed necessary to continue survey activity during 1981.

Accordingly, a 20m (O.A.L.) vessel used in the 1980 program was chartered and designated areas from Henley Hr. to Cartwright were surveyed.

In April of 1981, a fisherman from Fox Hr., Labrador, was engaged to fish crab pots under the ice in St. Lewis Inlet, continuing a similar survey conducted in February and March of 1980.

This report outlines the methods employed and the catch results obtained during the 1981 surveys along with conclusions reached.

SURVEY METHODS AND MATERIALS

Survey Vessel

The 20m vessel, M.V. "Cindy Elizabeth" was chartered for a 50 day fishing period to conduct the survey in coastal Labrador. This vessel was also chartered in 1980 for a snow crab survey of Notre Dame Bay and the west coast of the Island. The vessel's equipment consisted of:

- Decca 101 radar with a 24km range
- JRC Fish Finder, model NJA-155; 315m depth range
- Hy Seas 55 radiotelephone
- Kaar Sailfish VHF radio

The vessel was also equipped with Loran C navigation equipment, however, the "Labrador Sea Chain" of this system was not completely functioning because the Fox Hr., Labrador master station within this chain is not completed. Other electronic navigational systems are also unreliable in this area and it was necessary to determine latitude with Loran C from the Greenland and Cape Race signals and distance from land (or longitude) was established with radar.

Survey Plan

On a nautical chart of the Labrador coast, 25 transect lines were plotted at intervals of five (5) latitudinal minutes commencing at 52°N (Henley Hr.) and terminating at 54°N (Outer Gannet Island) (Figure 1).

Each transect line was surveyed by setting 7 fleets of 8 crab pots each at intervals along the line. The positioning of each fleet was varied to encompass

a range of water depths between 90 and 360m. Pots were set at positions between the near shore and offshore, to a maximum distance of 40km. Each fleet of pots was to fish for at least 20 consecutive hours. Each transect line constituted one (1) fishing day.

Recorded Data

When the crab pots were retrieved, crab from each pot were separated and measured across the carapace. This measurement was recorded along with the sex and shell hardness. Other data concerning location, time of setting and retrieval, bait type and fishing time were also recorded. The bottom temperature was recorded along each transect line when weather conditions permitted.

Fishing Gear

This was the same as described in Section 1 of this report. Conical crab pots, identical to the commercial fishing type, were used throughout the survey. This type of pot is 117cm in diameter at the bottom and 69cm at the top. The height of the pot is 64cm and the rod iron frame is covered with 14cm mesh polypropylene webbing. The opening for the crab is at the top and a vinyl plate extending partway into the pot prevents crab escapement. A drawstring closes the bottom webbing and releases it when emptying the crab catch. Bait is strung on insulated wire attached to the vinyl plate extending into the pot. Each pot weighs approximately 9kg.

Conical pots are fished in strings or fleets consisting of a number of pots equally spaced. Commercial crab fishermen normally use between 50 and 60 pots to a fleet. However, throughout the survey, eight (8) pots were used in each fleet. The pots were attached to 12.7mm diameter polypropylene rope which in turn, was attached to two (2) 152cm diameter floats at each end of the moorings. Each mooring was lengthened by ninety (90)m in case of unknown bottom depressions or tide in the area.

RESULTS

Southern Labrador

The catch results of the 1981 snow crab survey in Labrador are shown in Table 1. From June 18 to August 1, a total of 1424 crab pots were hauled resulting in a total catch of 9841 crabs. Of this total, 52% or 5108 crabs were over the commercial limit (95mm across the carapace) while the remainder were undersized. No female crabs were caught during the survey.

It was originally planned to use 56 pots per transect line, but the presence of numerous icebergs and poor weather led to a loss of some pots, resulting in an average of 53 pots being hauled per transect line with a minimum of 37 at transect lines 19 and 20. Over the twenty-nine days of actual fishing, an average of 49 pots were hauled per day with a minimum of 25 and a maximum of 56.

The highest average number of commercial crabs caught per pot was 12 totalling 5.4kg on transect line 11. The overall average number of crabs per pot was 4 within a range of 0 to 12. This corresponds to an average weight of 1.8kg per pot, a minimum of 0kg and a maximum of 5.4kg per pot. Only one of the transect lines where crabs were caught had no commercial-sized crabs. Soft shelled crabs accounted for 0.6% of the total catch, 52% of which were of commercial size.

St. Lewis Inlet

In 1981, the survey in St. Lewis Inlet spanned the period from April 8 to April 25. From six (6) pots set at fourteen (14) locations, a total of 52 crabs were obtained. Of these, 37 or 71% were of commercial size. The average number of commercial crabs per pot was 1, ranging from 0-2 commercial crab per pot. In terms of kg/pot, the average was 0.2 with a range of 0 - 0.9kg (Table 2).

WATER TEMPERATURES

Bottom temperatures were recorded for 23 of the 27 transect lines using two different reversing thermometers. (Table 2). All bottom temperaturess were within the range normally associated with crab populations (i.e. -2.0°C to 2.0°C, Squires,1965). Generally, the bottom temperatures appeared to have little or no bearing on crab catches.

DISCUSSION

The highest average weight of snow crabs caught per pot amounted to only 5.4kg, which is considerably less than the 12kg per pot used by the Department of Fisheries and Oceans as a minimum requirement for a commercially viable fishery (Hood, 1979). However, it should be noted that a survey covers a wide area comprising productive and non-productive grounds which could lead to a lower average catch than if productive grounds alone were fished for a lengthy period. Exploratory surveys are intended to determine whether or not any given species is found in a given area whereas actual commercial fishing effort usually determines the actual viability of each species fishery.

One area that indicated the potential for a commercial fishery extended from transect line 10 (off Square Island) to transect line 15 (off Partridge Head) comprising an area of 910km^2 (Figure 2). This area produced the highest average weight of crabs per pot for the entire survey; a minimum of 3.2kg and a maximum of 5.4kg. Extrapolating this data to a season of 60 fishing days using 150 pots, the total catch would amount to a minimum of 34.6 tonnes and a maximum of 58.3 tonnes. At $0.55 per kg, the gross income of one crab fishing enterprise could range from $19,000 to $32,000.

CONCLUSION

The 1981 and previous surveys indicated the presence of crab along the Labrador Coast. The catch rates experienced on these surveys were below the level considered necessary for a commercially viable operation. However, it is important to note that stock surveys do not give the comprehensive resource overview which is possible under actual commercial fishing activity. Given this consideration, survey catches along the Labrador Coast were sufficient to warrant further study by conducting a limited commercial fishery (i.e. two vessels) on an experimental basis.

ACKNOWLEDGEMENTS

In addition to the author, the following persons were involved in this project.

Government:

Gary Wilton, Assistant Project Officer
Department of Fisheries, St. John's, Newfoundland

Norah Lee, Assistant Project Officer
Department of Fisheries, St. John's, Newfoundland

Overall project and final report reviewed by:
Dr. H. Squires, Director, Program Planning and Review
Department of Fisheries, St. John's, Newfoundland

And

Harold Murphy, Director, Fishing Operations Division
Department of Fisheries, St. John's, Newfoundland

Industry:

Captain Wes Parmiter, M.V. "Cindy Elizabeth"
Pt. Leamington, Notre Dame Bay, Newfoundland

REFERENCES

Hood, P.R., 1980. An Economic Assessment of the Newfoundland Crab Fishery, 1979. Economic Services Branch, Fisheries and Oceans, Newfoundland Region.

Squires, H. J., 1965. Decapod Crustaceans of Newfoundland and Labrador and Canadian Eastern Artic. FRBC Manuscript Reports Series 810.

APPENDIX 1

TABLES

Table 1 : Catch of Snow Crab in Southern Labrador - June 18 - August 2, 1981

Transect Line No.	Date Hauled	No. of Pots	Depth Range (m)	Fishing Time (Days)	Total Catch (No.)	No. of Commercial Crabs	Average number of Commercial Crabs per pot	No. of Under-sized Crabs	No. of Female Crabs	No. of Large Soft Crabs	No. of Under-sized Soft Crabs
1	June 18	56	180-306	1	135	75	1	51	-	7	2
2	19	56	171-230	1	239	129	2	84	-	15	11
3	20,21	56	162-257	2	515	328	6	179	-	8	0
4	22	56	130-209	1	266	52	1	208	-	-	6
5	23	56	112-207	1	426	133	2	292	-	-	1
6	Aug. 2	54	112-191	1	159	44	1	115	-	-	-
7	June 25	56	153-288	2	760	505	9	254	-	1	-
8	26	56	153-261	1	515	266	5	244	-	1	4
9	27	56	149-207	1	443	189	3	254	-	-	-
10	28	56	149-184	1	817	399	7	416	-	-	2
11	29	48	144-173	1	1057	602	12	455	-	-	-
12	30	56	162-194	1	966	500	9	466	-	-	-
13	July 1	56	151-187	1	658	375	7	283	-	-	-
14	2	56	162-173	1	808	498	9	310	-	-	-
15	3	56	137-187	1	760	402	7	355	-	-	3
16	6,7	50	140-194	2	184	129	3	54	-	1	-
17	8	50	184-212	1	463	214	4	249	-	-	-
18	12	38	175-194	1	46	31	1	15	-	-	-
19	14	37	133-198	1	15	3	0	12	-	-	-
20	20	37	133-223	6	2	2	0	0	-	-	-
21	21	47	140-270	1	8	0	0	8	-	-	-
22	23	56	144-257	2	123	111	2	12	-	-	-
23	24	55	124-205	1	10	5	0	5	-	-	-
24	25	56	153-216	1	52	7	0	45	-	-	-
25	26	56	113-160	1	112	14	0	98	-	-	-
26	31	56	140-216	2	79	29	0	49	-	-	1
27	Aug. 1	56	137-270	1	223	66	1	157	-	-	-
Totals	-	1424	-	37	9841	5108	Avg. 4	4670	-	33	30

Table 2: Catch of Snow Crabs, through the ice, St. Lewis Inlet, Labrador, 1981.

Date Hauled	No. of Pots	Fishing Days	Total Catch	No. commercial Crabs	Avg. commercial Crabs per pot	Avg. wt. per pot (kg)[1]	No. of Undersized Crabs
Apr. 8	6	1	0	0	0	0	0
9	6	1	0	0	0	0	0
10	6	1	0	0	0	0	0
11	6	1	0	0	0	0	0
13	6	2	0	0	0	0	0
14	6	1	1	1	0	0	0
15	6	1	2	1	0	0	1
16	6	1	7	5	1	.5	2
18	6	2	4	3	1	.5	1
20	6	2	12	6	1	.5	6
21	6	1	3	0	0	0	3
22	6	1	5	5	1	.5	0
23	6	1	15	13	2	.9	2
25	6	2	3	3	1	.5	0
Totals	84	18	52	37	Avg. 1	Avg. 0.2	15

1. Based on .45kg. per pot.

Table 3: Bottom Temperatures and station depths taken during the Snow Crab Survey, Southern Labrador June - August, 1981.

Transect Line	Date	Bottom Temperature ^{o}C	Transect Line Depth Range(m)
1	June 18	0.6	180-306
2	19	0.4	171-230
3	20	-1.4	162-257
6	Aug. 2	0.45	112-19[illegible]
7	June 25	-1.6	153-288
8	26	-1.6	153-261
10	28	-1.1	149-184
11	July 31	0.40	144-173
13	29	0.40	151-187
14	29	0.35	162-173
15	27	0.40	137-187
16	27	0.40	140-194
17	27	0.40	184-212
18	27	0.45	175-194
19	27	0.40	133-198
20	27	0.45	133-223
21	27	0.40	140-270
22	23	0.25	144-257
23	24	0.35	124-205
24	25	0.25	153-216
25	26	0.25	113-160
26	31	0.30	140-216
27	Aug. 1	0.45	137-270

APPENDIX II

FIGURES USED IN TEXT

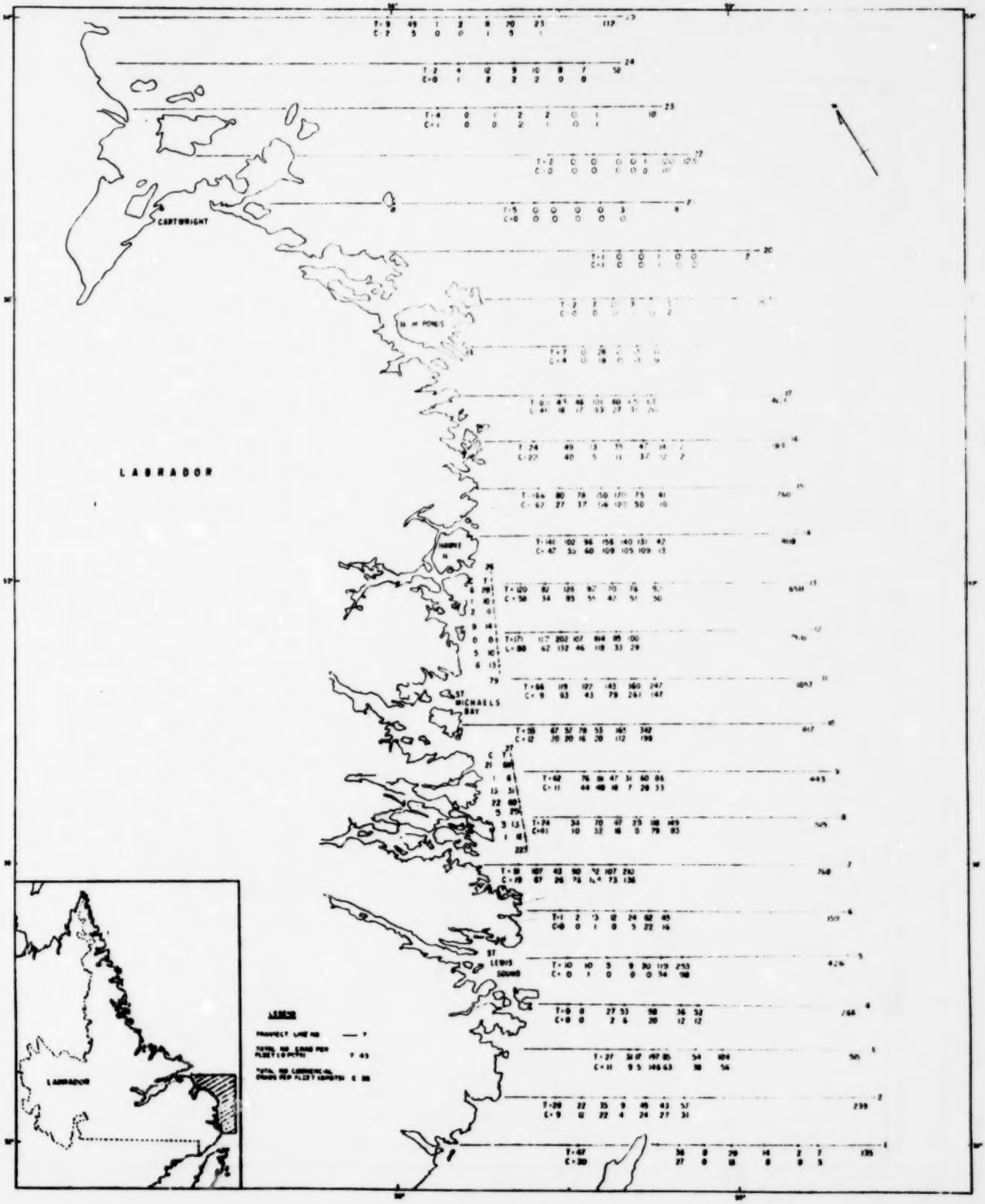

Figure 1: Transect Lines for 1981 Crab Survey Showing Total Crab and Commercial Crab Per Fleet.

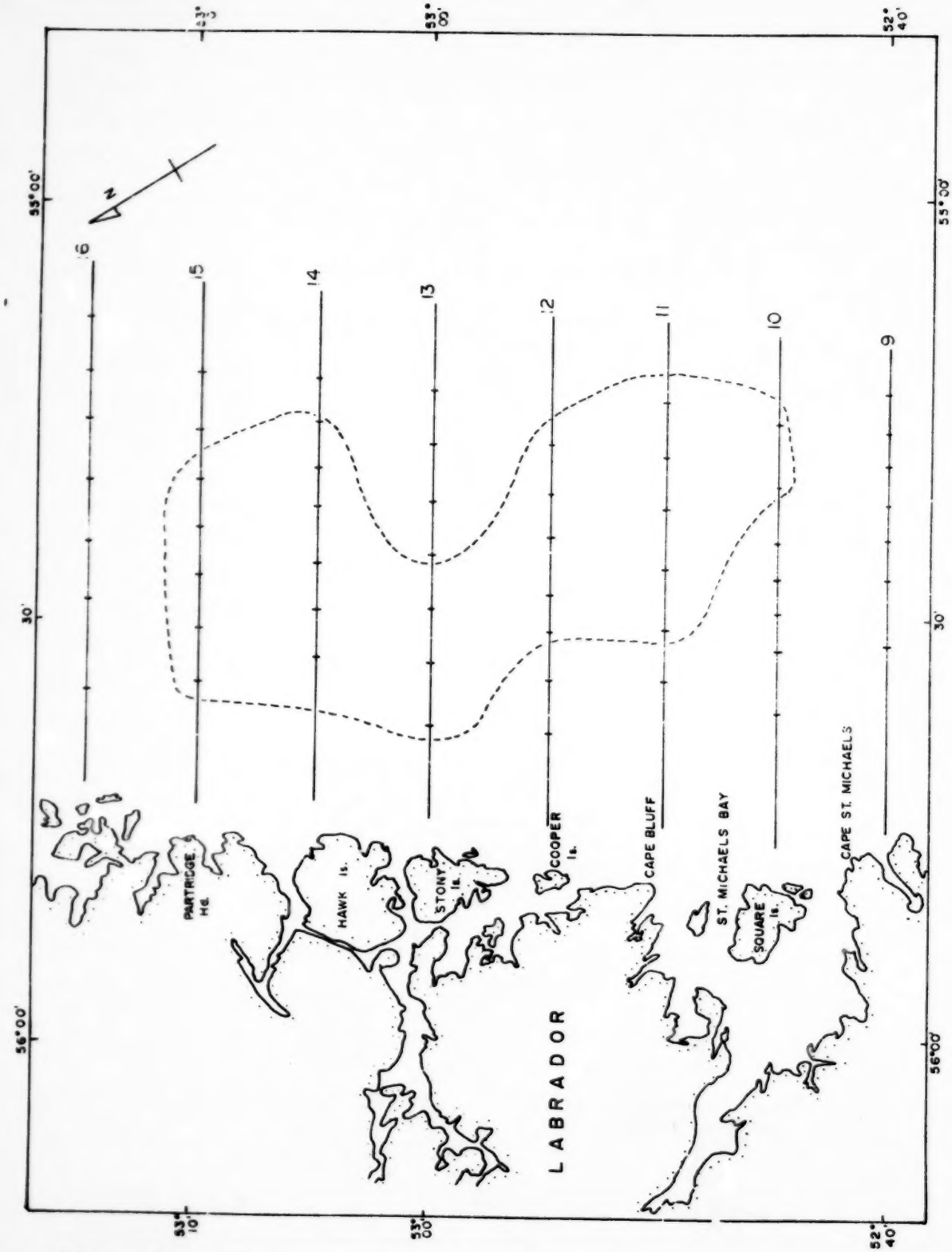

Figure 2: Survey Area with Highest Catch Results

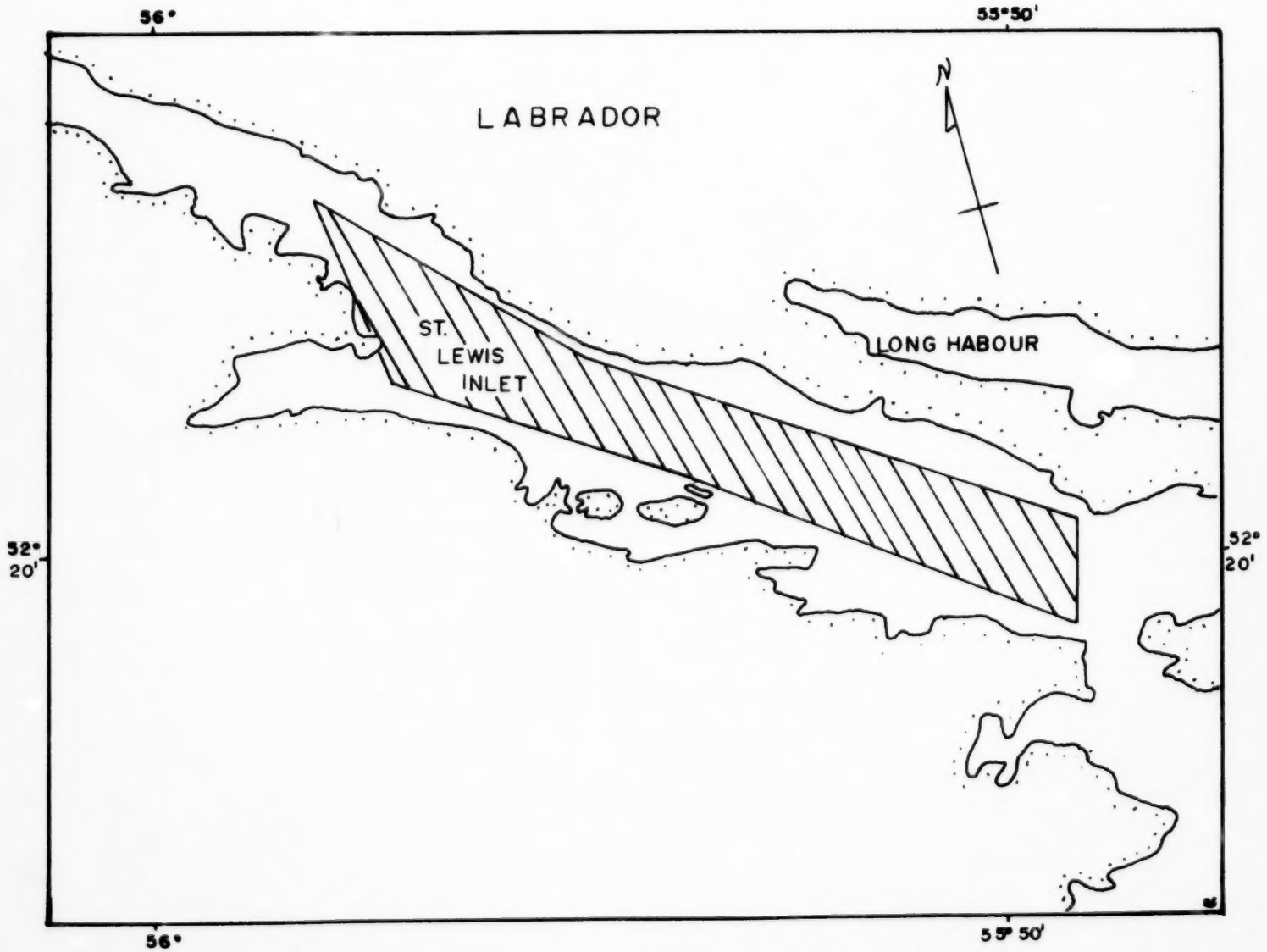

Figure 3: Snow Crab survey area in St. Lewis Inlet, Labrador, 1981

APPENDIX III

DEVELOPMENT BRANCH REPORTS

APPENDIX III

LIST OF DEVELOPMENT BRANCH REPORTS

Development Branch Reports is a series outlining the results of various fishing development projects conducted by the Newfoundland Department of Fisheries. Unless otherwise noted, information contained in these reports is unrestricted and can be quoted without prior permission. However, appropriate credit would be appreciated. Reports marked "restricted" may not be quoted without permission from the Department of Fisheries.

Other publications within this series are as follows:

Report No. 1 LUMPFISH ROE FISHERY (1978)

Report No. 2 COD TRAP PERFORMANCE IN FOGO ISLAND AND RENEWS AREA (1978)

Report No. 3 THE CAPLIN FISHERY (1978)

Report No. 4 THE DOGFISH FISHERY (1978)

Report No. 5 BAY D'ESPOIR FISHERY DEVELOPMENT ACTIVITIES

Report No. 6 DRIFTNETTING EXPERIMENT 1979

Report No. 7 CRAB EXPLORATION 1979

Report No. 8 DOGFISH DEVELOPMENT 1979

Report No. 9 LUMPFISH DEVELOPMENT 1979

Report No. 10 EEL DEVELOPMENT 1979

Report No. 11 STANDARDS FOR FISH QUALITY IMPROVEMENTS (1980)

Report No. 12 PRELIMINARY STUDY OF THE SEA URCHIN HARVEST POTENTIAL IN CONCEPTION AND PLACENTIA BAY (1979)

Report No. 13 AN ASSESSMENT OF MONOFILAMENT LINES IN THE NEWFOUNDLAND LONGLINE FISHERY

Report No. 14 DEVELOPMENT AND TESTING OF A HOOK BAITING DEVICE

Report No. 15 FISHING WITH LIGHTS REPORT 1980

Report No. 16	INSHORE FISH DISTRIBUTION PROGRAM FOR 1980
Report No. 17 (Internal)	A STUDY OF THE COD TRAP FISHERY IN SELECTED COMMUNITIES OF NEWFOUNDLAND
Report No. 18	LUMPFISH ROE FISHERY DEVELOPMENT IN NFLD. DURING 1980
Report No. 19	A REPORT ON THE BELL ISLAND FISHERY DEVELOPMENT ACTIVITIES 1979-1980
Report No. 20	EXPLORATORY FISHING FOR SCALLOPS IN SELECTED AREAS FROM BONNE BAY TO STRAITS OF BELLE ISLE DURING 1980 (FEBRUARY, 1981)
Report No. 21	LINE FISHING DEVELOPMENT LABRADOR STRAITS AREA 1980 (JANUARY, 1981)
Report No. 22	OTTER TRAWLING DEVELOPMENTS ON THE NORTHEAST COAST OF NEWFOUNDLAND DURING 1980 (FEBRUARY, 1981)
Report No. 23	EXPLORATORY FISHING FOR SNOW CRAB IN NOTRE DAME BAY, THE NORTHWEST COAST, SOUTHERN LABRADOR AND PLACENTIA BAY DURING 1980 AND 1981
Report No. 24	AQUACULTURE METHODS IN NEWFOUNDLAND (OCTOBER, 1981) (An Introduction)
Report No. 25	GROUNDFISH TRAWL EXPERIMENTS 1979-1981
Report No. 26	LUMPFISH ROE FISHERY DEVELOPMENT IN NEWFOUNDLAND DURING 1981

Copies of these reports are available without charge from:

Publications Officer
Department of Fisheries
P.O. Box 4750
St. John's, Newfoundland
A1C 5T7

POOR

QUALITY

ORIGINAL